

KSt 202- 811:2015

COMPANY STANDARD

CCPP UNIT MANAGER'S JOB DESCRIPTION

STOCK COMPANY SC « NTPP » NAVOI

KSt 202- 811:2015

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INSTEAD OF KSt 202- 811:2012

years or a specialized secondary education and work experience in engineering and technical and operational positions for at least 5 years.

2.3 The Head of the CCGP unit is appointed, moved and dismissed from the position by the director order of JSC "NTPP" on the proposal of the chief engineer of the personnel department of station in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The manager of the CCGT unit in administrative and economic activities submits to the director of JSC "NTPP", the production and technical activities - to the chief engineer of the station.

2.5 In the event of a long absence of the unit manager of the CCGT, the duties are assigned to the deputy head of the CCGT unit for operation.

2.6 The unit manager of the CCGT should be guided in its work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 of 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent, 2011;

Section I Chapter I. § 1-16;

Section II Chapter 2. § 4;

Chapter 3. § 1, 3, 4, 5, 7, 8, 9, 11, 12, 13;

Chapter 4 § 1, 2, 12, 13, 14;

Chapter 5 § 1-6;

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012 in the following volume:

Chapter I.

Chapter 2 § 1, 2;

Chapter 3 § 1-6, 9-14;

Chapter 4 § 2, 3, 4, 6, 8, 9.

Appendix: 2-8, 9.10, 11, 13-17, 19

- "Safety rules in the gas sector of the Republic of Uzbekistan", Tashkent 2004 in the following volume:

Kst 202-811: 2015

Chapter I. General Provisions. § 1, 2, 4, 5;

Chapter III. Operation of gas facilities. § 1, 2, 3, 4.7;

Chapter VI. Gas hazardous work. Appendices 1, 2, 31, 32.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 2010 in the amount of:

Chapter 1. General provisions § 1, 5-8;

Chapter 2. Designing § 1;

Chapter 5. Registration, technical survey,

permission to operate. § 12;

Chapter 6. Organization of safe operation and

repair § 1, 2, 3, 4;

Chapter 8. Paint Stains and Inscriptions Chapter 9 Safety Signs

Chapter 10 Accident and accident control Chapter 11 Control of compliance with regulations Annex 1, 2;

- "Fire safety rules for energy companies", Tashkent 2013;

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", 2011, in the amount of:

Chapter I. § 1;

Chapter 3. § 1, 2;

Chapter 4.

Chapter 5 § 1, 2;

Applications: 1, 2, 3, 6, 9, 10, 13, 14, 15;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Boilers", Tashkent, 1997, in the amount of:

Section 1. 1.1. - 1.4 .;

Section 2.

Section 3. 3.1. - 3.6 .;

Section 4. 4.1 .; 4.7 .;

Section 5. 5.1 .;

Section 6.

Section 7. 7.1. 7.4 .;

Section 8. 8.1. - 8.3 .;

Section 9.

Section 10.

Appendices 1, 2, 3, 4, 6.

- Occupational safety standards system;

- KSt 202- 032: 2008 "Rules for working with low-sulfur gas";

- "Instructions for first aid to victims in connection with accidents in the maintenance of power equipment";

KSt 202-811: 2015

- "Safety rules when working with tools and devices";

- Production and job descriptions of the unit;

- The Labor Code of the Republic of Uzbekistan, Tashkent, 1996.

- RH 34-400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry;

- RH 34-475: 2007 "Rules of internal labor regulations for employees of the executive apparatus of the State Joint Stock Company" Uzbekenergo ", its branch" Energosotish "and unitary enterprises";

- "Rules for the organization of work with personnel at energy production enterprises", registered by the Ministry of Justice of the Republic of Uzbekistan dated 04.10.2002 N 1178;

- "Explosion safety rules when using fuel oil and natural gas in boiler plants";

- Directory materials, operational and emergency response circulars of SJSC "Uzbekenergo";

- Orders, orders of JSC "NTPP", and other regulatory documents;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- Guidance document for the production of repair work (RDPR);

- KSt 202-038-2014 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity";

- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";

2.7 The Head of the CCGT unit should know:

- design and operation features and operational characteristics of all main and auxiliary equipment of the CCGT unit;

- technological diagrams of the equipment of the CCGT unit;

- location of fire extinguishing means and fire water supply system;

- the main electrical diagram of the CCGT unit;

- daily, monthly, quarterly and annual technical and economic indicators and targets for them;

- designation and operation principle of the control and measuring devices installed on the CCGT equipment, locking devices, automation, protection;

- the territorial location of equipment, pipelines of the valves of the unit of the CCGT;

KSt 202-811: 2015

- the fundamentals of economics, organization and management.

2.8 The periodicity of testing the knowledge of PTE, PTB, PPB, job descriptions and production instructions, rules for the installation and safe operation of equipment controlled by Sanoatgeocontechnazorat, is carried out within the following periods:

- primary - before admission to independent work;
- periodic - once in 3 years;
- extraordinary - in case of violation of rules and instructions, on demand

bodies of State Supervision, State Energy Inspectorate for the operation of power plants and networks and higher management bodies, as decided by special commissions.

2.9 Frequency of attestation:

- primary - after 1 year of work in this position.

The subsequent attestations are carried out according to the results of the passed attestation, but not less often than 1 time in 5 years.

2.10 The workplace of the unit manager of the CCGT is located in the service room of the unit, in the building of the unit of the CCGT.

2.11 Service areas - the whole territory of the equipment location of the CCGT unit and all elevations; waste heat boiler, gas and steam turbines, CCGT, cooling tower, GBCS with adjoining territory and gas pipelines in the territory of CCPP to the gate valves of the gas pipeline of the station, Chemical water treatment of CCPP.

3 Functions and responsibilities

3.1 Controls the operation and condition of equipment, mechanisms, devices and premises under the control of the unit, by detours and inspections, with the purpose of timely detection and troubleshooting.

3.2 Provides maintenance of the set mode of operation of the equipment of the CCGT unit.

3.3 Operational and technical maintenance of fixed unit equipment.

3.4 Takes measures to eliminate damage and eliminate emergency condition of equipment.

3.5 Participates in the investigation of the causes of accidents and failures in the operation of thermal mechanical equipment, maintains their records and analyzes, and organizes emergency repairs.

3.6 Monitors the serviceable state of the fire fighting equipment.

3.7 Keeps track of the cleanliness of equipment, facilities and territory fixed to the unit.

3.8 Participates in the development of annual and long-term plans of repair, reconstruction and modernization of the thermal mechanical equipment of the unit, in the organization and implementation of measures for science and new technology, occupational safety and safety technique.

3.9 Performs organizational, technical measures for preparation and withdrawal of CCGT equipment in capital, medium, current repairs.

3.10 Supervises the quality, volume of repairs performed works by the centralized repair unit, contractors, as well as accounting for materials and spare parts.

3.11 Carries out a thorough acceptance of the equipment from repair, performed by all repair sites, JSC "NTPP", contractors and foreign companies; leads claim work in case of poor repair by contractors and foreign companies.

3.12 Keep records and report on the production activities of the unit, maintains technical documentation.

3.13 Determines the amount of knowledge and safety instructions for all occupations and positions of workers, employees and engineering departments of the unit, submits for approval to the trade union committee and approval to the management of the station, organizes a timely review of them and provides them with jobs and requires their compliance.

3.14 Provides safe working conditions for the operation, maintenance, repair of equipment, buildings, structures and maintenance of technical processes.

3.15 Every day he gets acquainted with the records in the operational journal of the unit, in the journal of equipment defects, on the status of Safety techniques (ST) and industrial sanitation, visits them, and ensures the elimination of shortcomings. Requires a report from the deputy heads, the shift head at the beginning of the day about the state of ST, technological processes of equipment, remedies, violations of ST measures, norms and safe work practices.

3.16 Timely organizes the study of new and overhauled instructions and other documents on labor protection by workers and engineers, exercises control over their performance. Provides workplaces with journals, instructions, maps,

diagrams, posters, signs, safety, means for preparing jobs, ST inscriptions controls their safety and maintenance.

3.17 Participates in monthly safety precautions, fire safety. Supervises the observance of labor and production discipline and the implementation of instructions Fire Safety technique (FST), immediately suppresses the violation of their operational personnel.

3.18 Weekly check the condition of workplaces, tools, protective equipment, ventilation system, take measures to eliminate the identified violations.

3.19 Take measures to reduce the level of harmful factors, ensure the proper operation of ventilation and heating systems, a normal microclimate, the illumination of workplaces. Carries out the maintenance of the passport of sanitary-technical condition in the unit.

3.20 Ensures timely management of all types of training, briefing, testing of staff knowledge. He heads a commission to check the knowledge of workers, issues orders for admission to independent work.

3.21 Immediately informs the management of the station of the accident, participates in the commission for its investigation, draws up the acts on accidents, develops measures to prevent them and sends them for approval.

3.22 At units discusses the state of Work safety (WS) and ST, industrial sanitation, morbidity, violations, orders, orders. The staff of the unit with injuries reviews and other documents on WS and ST are informed.

3.23 Organizes timely medical examination by the staff of the unit.

3.24 Imposes penalties on the workers of the unit for violation of WS and ST, instructions. Represents materials to encourage employees for active assistance in compliance with FST.

3.25 Conducts work on development of rational work, study and introduction of advanced labor methods and experience of innovators in the energy sector.

3.26 Organizes the holding of days of ST, the work and equipping of cabinets and corners for ST literature, manuals.

3.27 Organizes the recording and analysis of malignancy, heads the engineering and medical team of the unit.

3.28 Supervises observance of labor and industrial discipline, implementation of instructions, regimes, FST, industrial sanitation, immediately suppresses their violation.

3.29 Daily checks selectively the preparation of jobs.

3.30 Organize the provision of workers with personal protective equipment, safety devices, soap, drinking water, coupons for milk.

3.31. Once a month, in conjunction with the chairman of the unit committee (senior engineer for WS and ST), in order to implement the second stage of control, conduct a check on the condition of working conditions and safety in the unit, assess the work of the 1st stage of control.

3.32 Stops the operation of the units when creating hazardous conditions. Controls the correctness of issuing orders, orders for the production of works.

3.33 Ensures the implementation in due time of prescriptions, activities for ST, stipulated by acts, orders, etc.

3.34 Prepares an annual plan of measures for the protection of labor and technology safety, industrial sanitation, and disease reduction.

3.35 Ensures timely management of all types of training, briefings, personnel knowledge testing. He heads a commission to check the knowledge of workers, issues orders for admission to independent work.

3.36 Monthly with the Engineer Technical Personnel (ETP) and public ST inspectors, it reviews the implementation of WS and ST activities, analyzes the work of public inspectors.

3.37 Organizes timely preventive inspection by the unit staff.

4 Rights

4.1 Take urgent measures to stop or reduce the load of equipment, stop the production of work by workers of any unit in the event of danger to people and equipment.

4.2 Discontinue production of equipment and remove from work of persons violating safety rules, fire safety or in the absence of a proper permit (order).

4.3 To issue outfits and give orders for the production of repair work on the CCGT equipment.

4.4 Apply for withdrawal to repair equipment.

4.5 To make proposals to the management of the power plant on imposing penalties on persons whose actions are unlawful or negligent in relation to their duties, or could lead to damage or unreasonable disconnections of CCGT equipment.

4.6 Sign the plan or report documents of unit.

4.7 Make proposals to the management of the power plant and participate in the development of activities aimed at fulfilling the main objectives of the unit, improving its technical and economic indicators, improving the working conditions of the unit staff.

4.8 Give technical and administrative orders to subordinate staff.

4.9 Control compliance with the workers of the unit of labor and production discipline, the requirements of rules and regulations on labor protection, technology, safety and industrial sanitation.

4.10 Establish, in consultation with the trade union organization, the working and rest regime of the unit staff in accordance with the current legislation.

4.11 Make proposals to the management of JSC "NTPP" on hiring, the dismissal and movement of the unit staff in accordance with applicable law.

4.12 Encourage or make proposals to the director of JSC "NTPP" on the promotion of distinguished workers in the unit.

4.13 To impose disciplinary sanctions on violators of labor and production discipline within their competence, in case of serious violations, to make proposals to the director of JSC "NTPP" on imposing penalties and reducing the premium.

5 Relationships

5.1 The relationship of the CCGT head is carried out in accordance with this job description and KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", and the approved management of JSC "NTPP" distributing the boundaries of maintenance of equipment, buildings and structures between the units.

6 Responsibility

6.1 The head of the unit of the CCGT is responsible for:

- implementation of the plan for the production and supply of electrical and thermal energy;
- execution of the dispatch schedule of loads;

- economy and reliability of operation of the thermal mechanical equipment fixed for the CCGT;
- safety of the equipment and property fixed to the unit;
- rational organization of work in the unit;
- timely and effective performance of the functions assigned to the unit, the full use of the rights granted to it.

6.2 The chief of the unit is responsible for the work of the whole unit, and each employee for the job site within the limits of the duties assigned to him by the job description.

6.3 The head of the unit and the engineering staff of the CCGT are personally responsible for failures in work and accidents on the equipment fixed to the unit floor, accidents, as well as tanning caused by their fault or the fault of the subordinate personnel.

6.4 The unit manager must comply with the requirements of the current legislation in the activities of subordinated personnel.

6.5 The head of the CCGT is involved in disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing his or her functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202- 811:2015

Information data

Designed by the CCPP Unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of department

EE. Davova

Service reliability of machinery and industrial safety

Head of service

Kh. O. Muminov

Legal Advisor

Sh.E. Nazarov

Responsible for standardization

NSNurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF THE DEPUTY HEAD ON OPERATION OF THE
CCPP UNIT**

STOCK COMPANY SC «NTPP»

NAVOI

KSt 202- 812:2015

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC "NTPP"
- 2 APPROVED AND RUN IN BY the order of SC « NTPP » №
- 3 INSTEAD OF KSt 202-812:2012

Approved

SC « NTPP » Director

K. Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF THE DEPUTY HEAD ON OPERATION OF THE CCPP UNIT

Term of validity from till

1 Application area

This instruction is based on KSt 202-810: 2011 "Regulations on the unit of combined-cycle combined cycle gas turbine plants", Qualification reference book for the posts of managers, specialists and employees in 1987. In order to regulate the functions, duties, rights and responsibilities of the deputy head on operation of the combined-cycle gas turbine plant (CCGTs), it is mandatory for him.

2. General Provisions

2.1 Deputy Head of the CCGT Unit for Operations organizes and conducts work with the operational staff of the unit in accordance with the "Rules of work with personnel at enterprises of energy production", and is the responsible person for the organization of labor of operational personnel; reliable, safe and economical operation of the equipment attached to the unit.

2.2 For the post of deputy head of the unit of the CCGT on operation is assigned to a person with a higher technical education and work experience in the field of engineering and technical positions for at least 3 years, or secondary specialized education and work experience in engineering and technical positions for at least 5 years.

2.3 Deputy Head of the CCGT Unit of Operations is appointed, moved and dismissed by the order of the director of the station on the proposal of the head of the unit of the CCPP, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The deputy head of the unit for the operation of the CCGT unit in the production, technical and administrative respect submits to the head of the CCGT unit.

2.5 All the operational staff of the CCGT unit are subordinated to the deputy head of the CCGT unit on operation for operational use in an administrative and technical sense.

The management of the operational staff is carried out as rule through the heads of shifts and the engineer-technologist of the unit of the CCPP.

2.6 All the masters for the operation of the CCGT unit are subordinate to the Deputy Head of Operations.

2.7 In the absence of the head of the unit and the deputy head for repair is replaced by the deputy head of the unit of the CCGT for operation.

2.8 In the absence of the head of the unit and the deputy head on operation is replaced by the deputy head of the unit of the CCGT for repair.

2.9 In his activity, the deputy head of the unit of the CCGT for operation is guided by official, operational instructions, methodological, regulatory documents, instructions, orders for the unit, station and SJSC "Uzbekenergo", Regulations on labor protection, Labor Code of the Republic of Uzbekistan.

2.10 The deputy head of the unit of the CCGT for operation of the equipment must know and be guided in its work:

- Indication of PP - 56;

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 of 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011:

Section I Chapter I. § 1-16;

Section II Chapter 2. § 4;

Chapter 3. § 1, 3, 4, 5, 7, 8, 9, 11, 12, 13;

Chapter 4 § 1, 2, 12, 13, 14;

Chapter 5 § 1-6;

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012 in the following volume:

Chapter I.

Chapter 2 § 1, 2;

Chapter 3 § 1-6, 9-14;

Chapter 4 § 2, 3, 4, 6, 8, 9.

Appendix: 2-8, 10, 11, 13-17, 19

- "Safety rules in the gas sector of the Republic of Uzbekistan", Tashkent 2004 in the following volume:

Chapter I. General Provisions. § 1, 2, 4, 5;

Chapter III. Operation of gas facilities. §1, 2, 3,4,7; Chapter VI. Gas hazardous work.

Appendices 1, 2, 31, 32.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 2010 in the amount of:

Chapter 1. General provisions § 1, 5-8;

Chapter 2. Designing § 1;

Chapter 5. Registration, technical examination, permission to operate. § 12;

Chapter 6. Organization of safe operation and repair §1, 2, 3, 4;

Chapter 8. Paint Stains and Inscriptions Chapter 9 Safety Signs

Chapter 10 Accident and accident control Chapter 11 Control of compliance with regulations Annex 1, 2;

- "Fire safety rules for energy companies", Tashkent 2013;

- "Rules of the device and safe operation of vessels, working under pressure", 2011, in the amount of:

Chapter I. § 1;

Chapter 3. § 1, 2;

Chapter 4.

Chapter 5 § 1, 2;

Applications: 1, 2, 3, 6, 9, 10, 13, 14, 15;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Boilers", Tashkent, 1997, in the amount of:

Section 1. 1.1. - 1.4 .;

Section 2.

Section 3. 3.1. - 3.6 .;

Section 4. 4.1 .; 4.7 .;

Section 5. 5.1 .;

Section 6.

Section 7. 7.1. 7.4 .;

Section 8. 8.1. - 8.3 .;

Section 9.

Section 10.

Appendices 1, 2, 3, 4, 6.

- KSt 202- 032: 2008 "Rules for working with low-sulfur gas";
 - "Instructions for first aid to victims in connection with accidents in the maintenance of power equipment";
 - "Safety rules when working with tools and devices";
- RH 34-400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry;
- RH 34-304-258: 2010 "Typical instructions. Contents and application of primary fire extinguishing means at electric power facilities ";
- "Explosion safety rules when using fuel oil and natural gas in boiler plants";
- The present job description, the Regulations on the CCGT unit of the job descriptions and production instructions of all subordinate personnel;
- KSt 202-036-2007 "Rules of internal labor regulations for employees of JSC" NTPP ";
- KSt 202-038-2014 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity";
- The Labor Code of the Republic of Uzbekistan. Tashkent, 1996;
- "Instructions for the investigation and recording of fires that occurred at energy facilities";
- Orders and orders of JSC "NTPP";
- Directive materials of SJSC "Uzbekenergo", operational and emergency circulars;
- "Rules for the organization of work with personnel at energy production enterprises", registered by the Ministry of Justice of the Republic of Uzbekistan dated 04.10.2002 N 1178;
- RH 34-301-800: 2006 "Typical instructions. Control and prolongation of the service life of the equipment of thermal power plants ";
 - "Regulations on the procedure for determining the timing of further operation of boiler components, turbines and steam lines operating at $T = 540\text{ }^{\circ}\text{C}$ ".
- Design and operational characteristics of the main and auxiliary equipment, technological diagrams of the equipment of the CCGT unit, location of fire extinguishing means and water supply system, location of equipment, pipelines, fittings; purpose and principle of operation, installed on the equipment of the CCGT unit, control and measuring devices, alarm devices, interlocks, automation,

protection; rules and norms of labor, safety precautions, industrial sanitation, fire protection; the fundamentals of labor law; daily, monthly, quarterly and annual technical and economic indicators and targets for them;

- Existing GOSTs, SSBT, KMC with reference to activities.

2.11. Testing of knowledge of Rules of technical operation, Rules of safety technique, Rules of fire safety, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time,

- extraordinary - in violation of rules and regulations, at the request of the State Supervision, the State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, Rules of fire safety, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of Rules of safety technique knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoat-Geocontekhnazorat" - once a year.

Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.12 The location of the deputy head of the unit of the CCGT for the operation of the equipment of the CCGT unit is located in the service room of the CCGT unit.

2.13 The service area of the deputy head for the operation of the equipment of the CCGT unit is the entire territory for the location of the CCGT unit equipment and all elevations; HRSG, steam turbine, gas turbine, machine hall of CCPP, water treatment and treatment plant CCGT, heating network, boiler room with network pumps.

3 Functions and responsibilities

3.1. Timely review of operational existing schemes, instructions. Develops instructions for the operation of new equipment; programs for switching equipment sampling; input, output of equipment from repair; provides workplaces with

circuits, instructions, requires compliance with the requirements of safety and operating instructions.

3.2 Provides safe working conditions for operational personnel during operation, maintenance of equipment and in the conduct of technological processes.

3.3 Every day, to get acquainted with the entries in the operational journal on state of Safety technique (ST) and industrial sanitation, visits the magazine, provides for the elimination of shortcomings, requires a report from the shift supervisor at the beginning of the day on the status of ST, technological process, protective equipment, and security breaches.

3.4 Timely organizes the study by operational staff new, revised instructions and other documentation on labor protection, exercises control over execution.

Provides workplaces with safety signs, means for preparing jobs, and controls their safety and maintenance.

3.5 Participates in conducting safety days. Follows compliance with labor and production discipline and the implementation of instructions Rules of safety technique, immediately suppresses the violation of their operational personnel.

3.6. Daily checks the preparation and condition of workplaces, monitors the operation of protection and measurement of the ventilation system, and takes measures to eliminate comments.

3.7 Take measures to reduce the level of harmful factors, provides a normal microclimate of the control panel of the CCGT, ventilation of the gas and steam turbine hall.

3.8 Ensure timely management of all types of training instructing, checking the knowledge of operational personnel, participating in a commission to check the knowledge of workers, issuing orders to admit to the independent work of operational personnel.

3.9 Immediately informs the head of the of the CCGTU of the unfortunate case, participates in its investigation, develops measures to prevent them.

3.10 At meetings, discusses the status of Labor safety and ST, industrial sanitary, morbidity, violations, orders, introduces operative personnel with injury surveys and other Labor safety and ST documents.

3.11 Organizes timely medical examination of operational staff.

3.12 Submits monthly to the head of the unit for approval lists for bonuses to operational staff for accident-free and economic operation of equipment and

depriving the premium, in whole or in part, for violators of Rules of technical operation, Rules of safety technique, production instructions, labor discipline.

3.13 Works on the development, study and implementation of advanced methods of work and experience of innovators in the energy sector.

3.14 Constantly acquaints staff with all changes, alterations and modernization of schemes and equipment, documentation on operation and repair of the equipment of the CCGT unit, making necessary changes to the relevant documents.

3.15 Ensures uninterrupted, reliable and economical operation of the plant equipment in accordance with the production program, Rules of technical operation, Rules of safety technique and current regulations and standards.

3.16 Coordinates with the unit manager and submits for approval to the chief engineer of the power plant, a program to train newly recruited workers and increase the production qualification of the unit's staff, control attendance of staff, the state and quality of technical training.

3.17 Sets or changes the operating mode of the unit equipment CCGT on the basis of the results of the testing of the adjustment organizations when agreeing changes with the unit manager and the production and technical department.

3.18 Supervises the availability of the unit and its departments with everything necessary for the execution of the production program (production and technical documentation, equipment, tools, technological equipment, materials, components, transport, loading and unloading facilities, etc.).

3.19 Controls the availability and consumption of maintenance materials.

3.20 Organizes the uninterrupted movement of work in progress.

3.21 Take measures to prevent and eliminate any deviations in the course of the production process and, if necessary, involve the relevant subdivisions of the unit in order to eliminate such violations.

3.22 Develops and takes measures to reduce equipment downtime.

3.23 Periodic patrol of workplaces of operational personnel CCGT and monitoring the operation of the equipment in accordance with the regime cards. Verification of staff performance of Rules of safety technique, Rules of fire safety and staff performance, as well as cleanliness of workplaces and equipment.

3.24 Participation in the general station commission for the reception of equipment after major, mid-term repairs.

3.25 Monitoring the start-up and shutdown of units, analyzing and developing these processes with personnel, filling out the journal of accidents and failures in work, developing measures to prevent accidents and failures in work.

3.26 Control over the operation of buildings, structures and construction designs of the unit.

3.27 Participation in the commissioning and testing of unit equipment of CCPP.

3.28 Organization and participation in emergency response training and instruction of the unit staff, preparation of manuals and quipment.

4 Rights

4.1 Direct management of the work of operational personnel CCGT unit through the heads of shifts.

4.2 Suspension of production work and removal from work of operational staff of the CCGT unit, which does not have the appropriate work permit (order) or grossly violating Rules of technical operation, Rules of safety technique, Rules of fire safety, internal regulations.

4.3 Submission for approval to the head of the unit of CCGT materials on the admission and dismissal of operational personnel according to the Labor Code Republic of Uzbekistan and the approved staffing schedule of the unit.

4.4 Arrangement of operational staff for shifts.

4.5 Making proposals for the encouragement of the staff of the CCGT unit or imposing on his administrative penalties.

4.6 In case of disagreement with the order of the unit manager of the CCGT Unit and obtaining the final decision, without suspending the execution of the order, to report to the chief engineer or director of the power plant.

5 Relationships

5.1 Fulfills all administrative and technical orders of head of the unit. In case of disagreement with the received order, the deputy head of the unit of the CCGT for operation of the equipment declares this, but upon receipt of an order, executes it, if this does not threaten the safety of the personnel or the safety of the equipment.

To verify the correct understanding of the received order necessarily repeats it to the person who gave this order.

5.2 In case of receiving an order directly from the director or the chief engineer of a power plant fulfills it and brings this to the attention of the unit's head of the CCGT

5.3 Gives orders and instructions to the operational staff of the CCGT unit, receives from them reports about all the malfunctions in the operation of the equipment of the CCGT unit, takes steps to eliminate them.

5.4 Coordinates the issues of the regime and the scheme of operation of equipment CCGT, associated with the operation of equipment of other units, with the head of the production-technical department and deputy heads of production units, resolving the disagreements through the head of the CCGT unit.

5.5 During telephone and radio calls, he first of all calls his post and a surname, and then transmits or receives an order or a message.

6 Responsibility

6.1 The deputy head of the unit of the CCGT of operations must comply with the requirements of the current legislation in the activities of subordinate personnel.

6.2 The deputy head of the unit of the CCGT for the operation is involved in disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic Uzbekistan.

Information data

Designed by the CCPP Unit of JSC "NTES"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

E. E. Davov

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Legal adviser

Sh. Y. Nazarov

Responsible for Standardization

N.S. Nurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF LEADING SOFTWARE ENGINEER OF CCPP
UNIT**

Navoi

KSt 202- 819:2015

Preface

- 1 DEVELOPED AND INTRODUCED by CCPP Unit of JSC "NTPP"
- 2 APPROVED AND RUN by the Order of JSC "NTPP"
No. 214 dated 30.04.2015
- 3 INSTEAD of KSt 202- 819:2012

KSt 202- 819:2015

Approved
by

General Director
JSC “NTPP”

K.Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF LEADING SOFTWARE ENGINEER OF CCPP UNIT

Valid from 01.05.2015 to
01.05.2018

1 Field of application

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Qualification Reference Book for positions of managers, specialists and employees 1987, in order to regulate the functions, duties, rights and responsibilities of the leading programmer engineer of the combined-cycle combined cycle gas turbine unit (CCGTs), and is mandatory for him.

2 General Terms

2.1 The Leading engineer-programmer of the unit of combined-cycle combined cycle gas turbine plants determines the information to be processed on a computer, its volumes, structures, layouts and schemes for entering, processing, storing and issuing information, and methods for its control.

2.2 The leading engineer-programmer is assigned, moved and is dismissed from the position held by the order of the plant's general director upon presentation of the head of the unit of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3 The leading software engineer submits to the head of the unit of the CCGT. The software engineer submits to the leading engineer-programmer

2.4 At the time of the absence of a leading software engineer, he is replaced by engineer-programmer of the CCGT unit.

2.5 A leading software engineer must have a higher technical or engineering-economic education without requiring a work experience, or a specialized secondary education and a minimum of 3 years experience in a Category I technician, or at other positions replaced by specialists with secondary specialized education, at least 5 years.

2.6 A leading software engineer should know and be guided in his activities:

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- Indication of PP - 56;

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules for the technical operation of power plants and networks Republic of Uzbekistan ", Tashkent 2011;

- "Safety rules for the operation of thermal mechanical equipment and heat networks", Tashkent 2012;

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004

- "Rules for the construction and safe operation of pressure vessels", 1990

- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

- Fire safety rules for energy companies, Tashkent, 2013;

- Production and job descriptions of the CCGT unit;

- The Labor Code of the Republic of Uzbekistan, Tashkent, 1996;

- RH 34 - 400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry";
- RH 34 - 475: 2007 "Rules of internal labor regulations employees of the executive apparatus of the State Joint Stock Company "Uzbekenergo", its branch "Energosotish" and unitary enterprises ";
- "Rules for the organization of work with personnel in enterprises energy production ", registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;
- Guidance and normative materials concerning the methods of programming and the use of computer technology in the processing of information;
- Technical and operational characteristics, design features, purpose and operation modes of equipment, rules for its technical operation;
- Technology of mechanized information processing;
- Methods of classification and coding of information;
- Formalized programming languages;
- Basic principles of structural programming;
- Types of software;
- The order of registration of technical documentation.
- Directive materials, operational and emergency circulars of JSC "Uzbekenergo";
- Orders, orders of JSC "NTPP", and other regulatory documents;
- KSt 202 - 038: 2008 "Regulations on awarding workers, managers, specialists and other workers of the station for the main results of economic activity ";
- KSt 202 - 036: 2007 "Rules of internal labor regulations employees of JSC "NTPP";
- Design and features of the operation and operational characteristics of all the main and auxiliary equipment of the CCGT unit;
- The main technological diagrams of the equipment of the CCGT unit;
- Location of fire extinguishing means and fire water supply system;
- Daily, monthly, quarterly and annual technical and economic indicators and targets for them;
- Purpose and principle of operation of the main instrumentation, alarm devices, interlocks, automatics, protection, installed on the equipment of the CCGT unit;
- Territorial location of equipment, pipelines and fittings of the CCGT unit;
- The fundamentals of the economy, the organization of labor and production organization, the rules and norms of labor protection, safety engineering, industrial sanitation and fire protection.

2.7 The verification of the knowledge of RULES OF TECHNICAL OPERATION, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;

- extraordinary - in violation of rules and regulations, at the request of the State Supervision, the State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of RULES OF TECHNICAL OPERATION, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of RULES OF SAFETY TECHNIQUE knowledge testing, device rules and safe operation of equipment controlled by the Agency "Sanoatgeocontechnazorat" - once a year.

Initial certification is carried out after 1 year of work in the of this position; The following attestations are conducted according to the results of past, but not less than 1 time in 5 years.

2.8 The workplace of the leading software engineer is located in the office building of the management building of the CCGT unit.

3 Functions and responsibilities

3.1 Control over the operation of service organizations for maintenance of software and hardware of the automated process control system.

3.2 Correction of the hardware settings of the System in case of changes in the operation period, the necessary changes in the switching circuits of measuring instruments.

3.3 Administration and archiving of the technological database of the system and applications of user software (hereinafter referred to as "software") in accordance with the regulations, maintenance of the communication server of the technological database, and the execution of preventive works on the server.

3.4 Backup of the software and the archive of operational data.

3.5 Providing methodological assistance in the preparation of data for the level of automated control systems, the processing of necessary documents and the decipherment of information processed by computer facilities.

3.6 Based on the analysis of mathematical models and algorithms (productions of economic and other problems) develops programs that implement the solution of the problem.

3.7 Develops the technology for solving the problem for all stages of information processing.

3.8 Selects the programming language and translates the task algorithms to it.

3.9 Identifies the information to be processed by computer facilities, its volumes, structure, layouts and schemes for input, processing, storage and delivery of information, methods for its control.

3.10 Performs work on preparing programs for debugging and debugging.

3.11 Runs debugged programs and input the initial data, determined by the conditions of the tasks.

3.12 Corrects the developed program based on the analysis of the output data.

3.13 Develops instructions for working with programs, prepares necessary technical documentation.

3.14 Determines the use of ready-made software.

3.15 Maintains the implemented programs and software.

3.16 Develops and implements methods and tools for automating programming, typical and standard software, constitutes information processing technology.

3.17 Performs work on unification and typing of computing processes.

3.18 Participates in monthly safety precautions, fire safety.

3.19 Weekly checks the status of workplaces, tools, means of protection, DCS equipment, takes measures to eliminate identified violations.

3.20 In the event of an accident, the software engineer must immediately contact the health center, informing the administration of the accident.

3.21 At unit meetings takes part in the discussion of the state of occupational safety and health, industrial sanitation, morbidity, and violations.

3.22 The leading engineer-programmer of the CCGT unit timely, according to the schedule, undergoes a medical examination.

4 Rights

4.1 Get acquainted with the draft decisions of the management of the unit and the enterprise regarding its activities.

4.2 To submit proposals for the improvement of work related to the duties provided for in this Instruction to the management.

4.3 Inform your immediate supervisor about all the shortcomings in the activities of the unit (its structural units) identified in the course of carrying out its official duties and make proposals for their elimination.

5 Relationships

5.1 The relationship of a leading software engineer is carried out in accordance with this job description.

6 Responsibility

6.1 Leading engineer programmer of CCGT unit should comply with the compliance of subordinate personnel with the requirements of the current legislation

6.2 The leading engineer - programmer of the unit of the CCGT is involved to disciplinary, administrative and other measures of liability for non-fulfillment or improper performance of their functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and

other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202-819: 2015

Informational data

Designed by the CCGT Unit of JSC "NTPP"

Head of unit
I. Kh. Abdulloev

Agreed

Production and Technical Department
Head of the department
T.K. Soliev

Planning and Economic Department
Head of the department
E. E. Davov

Service reliability of machinery and industrial safety

Head of the service
Kh. O. Muminov

Legal adviser
Sh. Y. Nazarov

Responsible for Standardization
N.S. Nurullaeva

COMPANY STANDARD

JOB DESCRIPTION OF SOFTWARE ENGINEER OF CCPP UNIT

JOINT STOCK COMPANY "NTPP"
Navoi

Preface

- 1 DEVELOPED AND INTRODUCED by CCPP Unit of JSC "NTPP"
- 2 APPROVED AND RUN by the Order of JSC "NTPP"
No. dated
- 3 INSTEAD of KSt 202- 820:2012

KSt 202- 820:2015

Approved
by

General Director
JSC “NTPP”

K.Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF SOFTWARE ENGINEER OF CCPP UNIT

Valid from

to

1 Field of application

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Qualification Reference Book for positions of managers, specialists and employees 1987, in order to regulate the functions, duties, rights and responsibilities of the programmer engineer of the combined-cycle combined cycle gas turbine unit (CCGTs), and is mandatory for him.

2 General Terms

2.1 The engineer-programmer of the unit of combined-cycle combined cycle gas turbine plants determines the information to be processed on a computer,

its volumes, structures, layouts and schemes for entering, processing, storing and issuing information, and methods for its control.

2.2 The engineer-programmer is assigned, moved and is dismissed from the position held by the order of the plant's general director upon presentation of the head of the unit of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3 The software engineer submits to the leading engineer-programmer and the head of the unit of the CCGT.

2.4 At the time of the absence of a software engineer, he is replaced by the leading engineer-programmer of the CCGT unit.

2.5 A software engineer must have a higher technical or engineering-economic education without requiring a work experience, or a specialized secondary education and a minimum of 3 years experience in a Category I technician, or at other positions replaced by specialists with secondary specialized education, at least 5 years.

2.6 A software engineer should know and be guided in his activities:

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- Indication of PP - 56;

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules for the technical operation of power plants and networks Republic of Uzbekistan ", Tashkent 2011;

- "Safety rules for the operation of thermal mechanical equipment and heat networks", Tashkent 2012;

- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

- Fire safety rules for energy companies, Tashkent, 2013;

- Production and job descriptions of the CCGT unit;

- The Labor Code of the Republic of Uzbekistan, Tashkent, 1996;

- RH 34 - 400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry";

- RH 34 - 475: 2007 "Rules of internal labor regulations employees of the executive apparatus of the State Joint Stock Company "Uzbekenergo", its branch "Energosotish" and unitary enterprises ";

- "Rules for the organization of work with personnel in enterprises energy production ", registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;

- Guidance and normative materials concerning the methods of programming and the use of computer technology in the processing of information;
- Technical and operational characteristics, design features, purpose and operation modes of equipment, rules for its technical operation;
- Technology of mechanized information processing;
- Methods of classification and coding of information;
- Formalized programming languages;
- Basic principles of structural programming;
- Types of software;
- The order of registration of technical documentation.
- Directive materials, operational and emergency circulars of JSC "Uzbekenergo";
- Orders, orders of JSC "NTPP", and other regulatory documents;
- KSt 202 - 038: 2008 "Regulations on awarding workers, managers, specialists and other workers of the station for the main results of economic activity";
- KSt 202 - 036: 2007 "Rules of internal labor regulations employees of JSC "NTPP";
- Design and features of the operation and operational characteristics of all the main and auxiliary equipment of the CCGT unit;
 - The main technological diagrams of the equipment of the CCGT unit;
 - Location of fire extinguishing means and fire water supply system;
 - Daily, monthly, quarterly and annual technical and economic indicators and targets for them;
 - Purpose and principle of operation of the main instrumentation, alarm devices, interlocks, automatics, protection, installed on the equipment of the CCGT unit;
 - Territorial location of equipment, pipelines and fittings of the CCGT unit;
 - The fundamentals of the economy, the organization of labor and production organization, the rules and norms of labor protection, safety engineering, industrial sanitation and fire protection.

2.7 The verification of the knowledge of RULES OF TECHNICAL OPERATION, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in violation of rules and regulations, at the request of the State Supervision, the State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of RULES OF TECHNICAL OPERATION, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of RULES OF SAFETY TECHNIQUE knowledge testing, device rules and safe operation of equipment controlled by the Agency "Sanoatgeocontekhnazorat" - once a year.

Initial certification is carried out after 1 year of work in the of this position; The following attestations are conducted according to the results of past, but not less than 1 time in 5 years.

2.8 The workplace of the software engineer is located in the office building of the management building of the CCGT unit.

3 Functions and responsibilities

3.1 Control over the operation of service organizations for maintenance of software and hardware of the automated process control system.

3.2 Correction of the hardware settings of the System in case of changes in the operation period, the necessary changes in the switching circuits of measuring instruments.

3.3 Administration and archiving of the technological database of the system and applications of user software (hereinafter referred to as "software") in accordance with the regulations, maintenance of the communication server of the technological database, and the execution of preventive works on the server.

3.4 Backup of the software and the archive of operational data.

3.5 Providing methodological assistance in the preparation of data for the level of automated control systems, the processing of necessary documents and the decipherment of information processed by computer facilities.

3.6 Based on the analysis of mathematical models and algorithms (productions of economic and other problems) develops programs that implement the solution of the problem.

3.7 Develops the technology for solving the problem for all stages of information processing.

3.8 Selects the programming language and translates the task algorithms to it.

3.9 Identifies the information to be processed by computer facilities, its volumes, structure, layouts and schemes for input, processing, storage and delivery of information, methods for its control.

3.10 Performs work on preparing programs for debugging and debugging.

3.11 Runs debugged programs and input the initial data, determined by the conditions of the tasks.

3.12 Corrects the developed program based on the analysis of the output data.

3.13 Develops instructions for working with programs, prepares necessary technical documentation.

3.14 Determines the use of ready-made software.

3.15 Maintains the implemented programs and software.

3.16 Develops and implements methods and tools for automating programming, typical and standard software, constitutes information processing technology.

3.17 Defines the aggregate of data that provides solutions to the maximum number of conditions included in the program, performs work on its preparation and debugging.

3.18 Debug developed programs, adjusts them in the process of refinement.

3.19 Determines the possibility of using ready-made programs developed by other enterprises.

3.20 Develops and introduces methods of programming automation, standard and standard programs, programming programs, translators, input algorithms.

3.21 Performs work on unification and typing of computing processes.

3.22 Participates in monthly safety precautions, fire safety.

3.23 Participates in the creation of catalogs and card indexes of standard programs, in the development of forms of documents to be machine-processed in the design work to expand the field of application of computer technology.

3.24 Weekly checks the status of workplaces, tools, means of protection, DCS equipment, takes measures to eliminate identified violations.

3.25 In the event of an accident, the software engineer must immediately contact the health center, informing the administration of the accident.

3.26 At unit meetings takes part in the discussion of the state of occupational safety and health, industrial sanitation, morbidity, and violations.

3.27 The engineer-programmer of the CCGT unit timely, according to the schedule, undergoes a medical examination.

4 Rights

4.1 Get acquainted with the draft decisions of the management of the unit and the enterprise regarding its activities.

4.2 To submit proposals for the improvement of work related to the duties provided for in this Instruction to the management.

4.3 Inform your immediate supervisor about all the shortcomings in the activities of the unit (its structural units) identified in the course of carrying out its official duties and make proposals for their elimination.

5 Relationships

5.1 The relationship of a software engineer is carried out in accordance with this job description.

6 Responsibility

6.1 The engineer - programmer of the unit of the CCGT is involved to disciplinary, administrative and other measures of liability for non-fulfillment or improper performance of their functional duties that led to the occurrence of

accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202-820: 2015

Informational data

Designed by the CCGT Unit of JSC "NTPP"

Head of unit
I. Kh. Abdulloev

Agreed

Production and Technical Department
Head of the department
T.K. Soliev

Planning and Economic Department
Head of the department
E. E. Davov

Service reliability of machinery and industrial safety

Head of the service
Kh. O. Muminov

Legal adviser
Sh. Y. Nazarov

Responsible for Standardization
N.S. Nurullaeva

KSt 202- 821:2013

COMPANY STANDARD

JOB DESCRIPTION OF ELECTRONICS ENGINEER OF CCPP UNIT

STOCK COMPANY SC «NTPP»

NAVOI

KSt 202- 821:2013

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC " NTPP "
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INTRODUCED FOR THE FIRST TIME

Approved

OJSC « NTPP» Director

K. KH. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF ELECTRONICS ENGINEER OF CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Qualification Reference Book for the positions of managers, specialists of employees 1987, for the purposes of regulating the function, duties, rights and responsibilities of the electronic engineer of combined cycle combined cycle (CCGTs) and is mandatory for him.

2 General terms

2.1 The electronic engineer of the unit of combined-cycle combined cycle gas turbine plants monitors and reliably manages the equipment of the automated process control system at the CCPP.

2.2 The electronic engineer of the CCGT must have a higher engineering education without claiming to work experience or secondary specialized education and experience work in the position of a technician of the 1st category for at least 3 years or on other posts replaced by specialists with an average special education, at least 5 years.

2.3 The electronic engineer of the CCGT unit is appointed, moved and dismissed from the position by the order of the station director on the proposal of the Personnel Department and the Head of the CCGT unit, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The electronic engineer of the CCGT unit is administratively subordinate to the head of the CCGT CC, and in the production and technical assistant to the unit manager of the CCGT unit.

2.5 The electronics engineer of the CCGT unit should know and be guided in its work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline";
- Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules for the technical operation of power plants and networks Republic of Uzbekistan ", Tashkent, 2005;
- "Safety rules for the operation of thermal mechanical equipment and heat networks"
- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent, 2004;

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", 1990;
- "Instruction on rendering first aid to victims in communication with accidents at service of the power equipment ";
- Fire safety rules for energy companies, Tashkent, 2004;
- Production and job descriptions of the CCGT unit;
- The Labor Code of the Republic of Uzbekistan, Tashkent, 1996;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- RH 34 - 400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry";
- RN 34-475: 2007 "Rules of internal labor regulations for employees of the executive apparatus of the State Joint Stock Company" Uzbekenergo ", its branch" Energosotish "and unitary enterprises;
- "Rules for the organization of work with personnel in enterprises Energy production », registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;

2.8 The electronics engineer of the CCGT unit should know:

- normative documents concerning the operation and repair of electronic computers;
- technical and operational characteristics, design features, purpose and operation modes of the process control system equipment.
- technical operation;
 - types of technical information carriers;
 - Methods for the development of prospective and annual plans (schedules) of work and the procedure for reporting on their implementation;
 - organization of repair service;
 - maintenance of electronic computers;
 - the procedure for drawing up applications for equipment, spare parts,
 - read the diagrams and repairs, the interconnection of electronic blocks between other control devices.
 - Location of equipment

- the fundamentals of economics, organization and management;
- rules and norms of labor protection, safety precautions, industrial sanitation and fire protection.

2.9 Testing the knowledge of RULES OF TECHNICAL OPERATION, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY , should be performed:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in violation of rules and regulations, at the request of Sanoatgeocontechnazorat, Uzdavenergonazorat, higher authorities, as decided by the special commission.

Periodic testing of knowledge of RULES OF TECHNICAL OPERATION, RULES OF FIRE SAFETY , production and job descriptions should be made at least once in 3 years.

Periodicity of RULES OF SAFETY TECHNIQUE knowledge testing, device rules and safe operation of equipment controlled SI "Sanoatgeocontechnazorat" - once a year.

2.10 Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.11 The workplace of the electronic engineer of the CCGT unit is located in the management building of the CCGT unit.

2.12 The service area is the switchboard for the management of the CCGT unit, as well as the DCS in the control rooms of the GT, ST PN, Chemical water treatment (CWT), cooling tower and GBCS section.

3 Functions and responsibilities

3.1 Carry out work according to the Rules of Organization of Work with the personnel at the enterprises of power production.

3.2 To monitor the operation of the electronic equipment of the CCGT unit, to ensure uninterrupted and reliable operation and timely elimination of the defects that have arisen together, by software engineers and C&I engineers, to monitor the cleanliness of jobs.

3.3. Inform the deputy head of operation of the unit about all detected by the personnel or operational personnel of the shift in the work of equipment and the measures taken to eliminate them.

3.4 In the event of an accident, failure to work, malfunctioning of the equipment, fire in cable half-stories or cable routes, act in accordance with the Rules for Technical Operation and Electrical Networks of the Republic of Uzbekistan and instructions for eliminating malfunctions, investigating accidents and accidents.

3.5 Regularly revise the schemes, instructions to check their status and match the date of revision.

3.6 Carry out adjustment of elements and electronic blocks of computer technology, radio electronic equipment and individual devices and units.

3.7 To improve qualifications, study guidance materials SJSC "Uzbekenergo" and attend thematic courses of technical training of engineers.

3.8 Notify the head of the unit of the CCGT and his deputy head of operation for all unplanned outages of electronic equipment of the CCGT unit.

4 Rights

4.1 Within the limits of its competence, inform the immediate supervisor about all the shortcomings identified in the course of the activity and make proposals for their elimination.

4.2 To submit proposals for the improvement of work related to the responsibilities provided for in this Instruction to the management.

5 Relationships

5.1 Carries out all production and technical orders of the deputy head of operation of the CCGT unit.

5.2 Coordinates orders received directly from the director or the chief engineer of the station with the notification of the head of the CCGT or his deputy head of operation and performs them.

5.3 Will appeal against the orders of the deputy head on operation of the CCGT unit in front of the unit manager of the CCGT, without suspending its execution until a final decision is made by the unit management.

6 Responsibility

6.1. The electronic engineer of the unit of combined cycle gas turbine plants must comply with the requirements of the current legislation in the activities of subordinated personnel.

6.1. The electronic engineer of the unit of combined cycle gas turbine plants is involved in disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of his functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Informational data

Designed by the CCPP unit of OJSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

F. R. Khozhiev

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Legal adviser

T.A. Toilokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE LEADING ENGINEER ON THERMAL
MECHANICAL EQUIPMENT OF CCPP UNIT**

STOCK COMPANY SC « NTPP »

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INTRODUCED FOR THE FIRST TIME

Approved

SC « NTPP » Director

K. Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF THE LEADING ENGINEER ON THERMAL MECHANICAL EQUIPMENT OF CCGT UNIT

Term of validity from

till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", Qualification directory of positions of managers, specialists and employees, 1987, in order to regulate the functions, duties, rights and responsibilities of the leading heat engineering engineer Thermal Mechanical Equipment (TME), and is mandatory for him.

Knowledge of this job description is mandatory for the deputy head of the CCGT unit for operation, the deputy head of the CCGT unit for repair of equipment, the head of the CCGT and the shift supervisor of the CCGT.

2 General terms

2.1 The main task of the leading heat and power engineering engineer on TME of CCGT is the development of measures for the operation of CCGT equipment in accordance with the Rules of Technical operation of power plants and networks, Tashkent 2005, and other normative documents and control over the implementation of operational personnel of the CCGT Rules of technical operation operating personnel of technological norms and requirements of the manufacturer, official, operational and fire-fighting instructions.

2.2 The leading heat engineering engineer on TME of CCGT should have a higher technical education requirements for work experience of at least 1 year or an average special education and work experience in the post of a technologist of the 1st category for at least 3 years or in other positions replaced by specialists with an average special education, at least 5 years.

2.3 The Lead Engineer of the Heat and Power Engineer, based on the TME of CCGT, is appointed, relocated and dismissed from the position by the director of the station upon presentation of the Head of the CCGT unit, HR department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 Leading heat-and-power engineer on TME of CCGT in administrative terms, is subordinate to the head of the CCGT, and in production and technical directly to the deputy head of the CCGT for operation.

2.5 All the operational personnel of the CCGT unit are subordinate to the leading heat engineering engineer for the TME CCGT in production and technical activities.

2.6 In the event of a long absence of a leading engineer of heat and power engineering, all functions and responsibilities are assigned to the deputy head of the CCGT for operation.

2.7 The leading heat engineering engineer for the TMO of CCGT should know and be guided in its work:

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks" in the following volume:

Section 1;

Section 2. Subsections 2.1-2.11;

Section 3. subsection 3.2 clauses 3.2.40-3.2.97;

subsections 3.3; 3.6; 3.7 items 3.7.9 to 3.7.12,

3.7.14, 3.7.17-3.7.26, 3.8, 3.8.7-3.8.22,

3.8.27, 3.8.26, 3.8.29-3.8.34;

Section 4. subsections 4.1-4.8;

Appendices 1-9.

- "Fire safety rules for energy enterprises », Tashkent 2004, in the following volume:

Chapter I § 1, 2;

§ 3 paras. 33-38;

Chapter II § 1, 2;

Chapter III § 1, 2, 3;

Chapter IV § 1, 2, 3, 4;

Appendix № 1.

Section I § 1, 2;

Section II § 4 paragraph 99;

§6;

Section III § 2;

Section IV § 1;

Section V § 2;

Section VI § 2;

Appendix 5.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan », Tashkent 2005, in the following volume:

Section I Chapter I § 1, 2, 3, 4, 6, 7, 8, 12, 13, 14, 15, 16;

Appendix No. 1;

Chapter 2. § 4 paras. 120-125;

Chapter 3. § 1, paragraphs 145-147, 149, 150, 173, 174, 176, 182,
183, 186, 201-208, 212-218;

§ 3 paras. 236-252, 255-262, 265-280;

§ 4;

§ 5 315-330;

§ 7, § 8, § 9, § 11;

Chapter 4 § 2;

§ 12 paras. 811-815;

§ 14 paras. 843, 852-865;

Chapter 5 § 1 866-875;

§2;

§ 3 903, 904;

§ 4,905 - 916;

§ 5 917 - 924;

§ 6 929 - 931.

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", Tashkent 1997, in the following scope:

Section 1;

Section 2;

Section 3;

Section 4 subsection 4.6;

subsection 4.8;

Section 5 subsection 5.1;

Section 6;

Section 7;

Section 10;

Appendix: 1, 3, 4.

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004, in the following volume:

Chapter I § 1 paragraphs 1, 2;

§ 2 paragraphs 5-8;

§3;

§ 4 paras. 11, 12, 14;

§ 5;

Chapter II § 2;

Chapter III § 1;

§2;

§ 3 paras. 47-53, 55, 59, 66, 70, 71, 73, 75, 76, 77, 81, 85;

§ 4 paras. 86, 88-101;

§ 7;

§ 11 paras. 265, 266, 277;

§ 12;

Chapter V;

Chapter VI;

Chapter VII;

Appendix: 1, 2, 8, 15, 31, 32.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", Tashkent, 1992, in the following scope:

Section 1;

Section 2;

Section 3;

Section 4;

Section 5;

Section 6;

Section 7

Applications: 1, 3, 4, 5, 6, 7.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Boilers", Tashkent 1997, in the following scope:

Section 1;

Section 2;

Section 3;

Section 4 subsections 4.1-4.7, 4.10;

Section 5 subsection 5.1;

Section 6;

Section 7 subsections 7.1-7.4;

Section 8;

Section 9;

Section 10;

Appendices 1, 3, 4.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules for the organization of work with personnel at energy production enterprises", registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- "Safety rules when working with tools and devices."

- "Explosion safety rules for the use of oil and natural gas in boiler plants".

- KSt 202-032: 2008 "Rules for working with low-sulfur gas."

- "Instructions for the investigation and recording of fires that occurred at energy facilities";

- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

- "Instruction for the investigation and recording of technological violations in the operation of power plants, networks and power systems";

- A real job description;

- Typical factory instructions for the operation of the main and auxiliary equipment of the CCGT Unit.

- Orders, orders of OJSC "NTPP", and other administrative documents;
- Directive materials, operational and emergency circulars of SJSC "Uzbekenergo";
- KSt 202-038: 2008 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity ";
- Labor Code of the Republic of Uzbekistan, Tashkent, 1996;
- KSt 202-057: 2007 "Regulations on the Occupational Health and Safety Management System at OJSC" NTPP "
- KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine installations".

2.8 The leading engineer of the CCGT unit must know and be guided in its work by the operating instructions for the operation of CCGT equipment, as well as the daily, monthly and annual technical and economic indicators and the planned tasks for them.

2.9 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, should be performed:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in violation of rules and instructions, at the request of the bodies of "Sanoatgeocontechnazorat", State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoatgeocontechnazorat" - once a year.

2.10 Initial certification is carried out after 1 year of operation in this position; The following attestations are conducted according to the results of past, but not less than 1 time in 5 years.

2.11 The workplace of the leading heat engineering engineer of the CCPP is located in the room of the engineering department of the building of the CCGT control and is equipped in accordance with the "Typical projects for the organization of workplaces for engineers and technicians, units for thermal power plants".

2.12 The service area is the entire territory of the equipment location of the CCGT unit, all elevations, height HRSG, gas and steam turbines, a CCPP compressor station, a cooling tower, GBCS with the adjacent territory and gas pipelines in the territory of the CCGT before the gate valves of the gas pipeline of the station.

3 Functions and responsibilities

3.1 Drawing up schedules for checking the knowledge of the personnel of the CCGT unit on Rules of technical operation, RULES OF SAFETY TECHNIQUE, Rules of fire safety and organize this check.

3.2 Draw schedules for testing equipment in accordance with Rules of technical operation, instructions, operating manuals and technical maintenance of the manufacturer and monitor their performance, schedules for the inspection of equipment subject to control by the SI "Sanoatgeocontehnazorat".

3.3 Draw up schedules, develop a program and organize the conduct of unit anti-emergency and fire fighting.

3.4 To monitor the proper operation and timely inspection of the SI "Sanoatgeocontehnazorat" facilities.

3.5 To issue technical documentation for the execution of all schedules of equipment testing, personnel knowledge testing, SI "Sanoatgeocontehnazorat".

3.6. It monitors the performance of Rules of technical operation, RULES OF SAFETY TECHNIQUE, operational and production instructions, technological discipline by operational personnel.

3.7 Make plans for the organization of jobs.

3.8 Develops technological schemes, route maps, instructions, changes the technical documentation in connection with the adjustment and change of technological processes.

3.9 Participates in the development of measures to reduce accidents, refusals in the unit.

4 Rights

4.1 Receive from other units of OJSC "Navoi TPP" documents and information necessary for the performance of production duties.

4.2. Give the technical staff instructions to the operational personnel through the CCGT and demand their execution.

4.3 Do not comply with the instructions that are contrary to this instruction, the requirements of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, as well as posing a threat to the safety of people, the safety of equipment.

4.4. Suspend the work being performed by CCGT personnel in the event of gross violations of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, fire safety instructions, internal labor regulations.

4.5 Prohibit the performance of work with the use of a faulty tool, tools and the use of materials and spare parts that do not meet the technical requirements.

4.6 Appeal to the head of the unit of the CCGT of the order of the deputy head of the CCGT for the operation of the equipment in case of disagreement with it.

4.7 To apply to the deputy head of the CCGT CC for exploitation on imposition of penalties, incentives for operational personnel of the CCGT.

5 Relationships

5.1 Carries out the orders of the unit manager of the CCGT and the deputy head of operation.

5.2 In case of receiving an order directly from the director of the power plant, the chief engineer or the unit manager, it executes them and brings them to the attention of the deputy head of the CCGT for operation.

5.3 In operative telephone conversations, he first of all names his position and surname, and then transmits or receives an order or a message; To verify the correct understanding of the received order, he repeats it to the person who issued the order.

5.4 The order of the leading heat engineering engineer on TME of the CCGT can be canceled by the deputy head of the CCGT unit of operation or by the head of the CCGT CC.

6 Responsibility

6.1 The leading heat engineering engineer for TME of CCGT should comply with the requirements of the current legislation in the activity of subordinated personnel.

6.2 The leading heat engineering engineer on TME of CCGT is involved in disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of its functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan

KSt 202-823: 2013

Informational data

Designed by the CCGT unit of OJSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

F. R. Khozhiev

Legal adviser

T.A. Toilokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE SHIFT HEAD (SUPERVISOR) OF CCPP
UNIT**

STOCK COMPANY SC « NTPP »

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP UNIT of JSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INSTEAD OF KSt 202- 817:2012

K. Kh. Ganiev

JOB DESCRIPTION OF THE SHIFT HEAD (SUPERVISOR) OF CCPP UNIT

Term of validity from till

This instruction is developed based on KSt 202-810: 2011 "Regulations on the unit of combined-cycle gas turbine plants", the Qualification Reference Book for the positions of managers, employees' specialists 1987, for the purpose of regulating the functions, duties, rights and responsibilities of the head of the shift unit for combined cycle steam and gas turbine plants (CCGTs) and is mandatory for the shift head of the CCGT, the station shift head, Engineer technical personnel of CCGT.

2.1 The shift head of CCPP organizes and carries out the work with the operational management personnel in accordance with the "Rules of the organization of work with the personnel at the enterprises of energy production", and is the person responsible for the organization of operational personnel work;

reliable, safe and economical operation of the equipment attached to the unit. As well as shift staff compliance of the CCGT of official and industrial instructions, Rules of technical operation, Rules of safety technique, Rules of fire safety, labor and production discipline, internal labor regulations.

2.2 The post of shift head of CCGT appointed person having higher technical education and professional experience of at least 2 years or specialized secondary education and experience in the operational management of the production work for at least 3 years.

2.3 Prior to being appointed to independent work, the shift head of CCGT should:

2.3.1 Undergo the production training according to the individual training program.

2.3.2 Pass the examinations of the qualification commission under the chairmanship of the technical manager of the organization.

2.3.3 After passing the exams to pass duplicating at workplace shift head of CCGT for at least 12 working shifts, under the guidance of an experienced shift head of CCGT, while for all activities equally have a responsibility as a major shift supervisor and understudy.

2.3.4 After completion of the period of duplication, pass emergency and fire fighting training.

2.4 The CCGT shift supervisor is assigned, moved and is relieved of his post by the order of the station director on the recommendation of the head of the CCGT and the personnel department, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.5 The head of shift of the CCGT in administrative and technical terms is subject to the head of the unit and his deputy for exploitation. Operatively, he obeys the head of the shift of station. The entire operational staff of the CCGT unit is administratively and technically responsible for the replacement of the CCGT

The management of the work of operational personnel is carried out, as a rule, through the deputy. the head of the unit for operation and the leading engineer-technologist of the CCGT.

2.6 In the event of a long absence of the shift head, his duties are assigned to deputy. the head of the CCGT.

2.7 In its activities, the shift is guided by CCGT officers, operating instructions, technical maps, directions, orders, administrative documents or indication on the unit floor, the station and "Uzbekenergo" Regulations on Labor.

2.8 The shift supervisor of the CCGT should know and be guided in its work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011 in the amount of:

Section I Chapter 1 § 1, 2, 3, 4;

§ 5 paras. 75, 76, 80-84;

§ 6, paragraphs 85, 87, 89;

§ 7 paras. 94, 105, 107;

§ 8 paras. 124, 125;

§ 12, 13, 14;

§ 15 para. 224;

§ 16 paras. 236, 241, 242

Table 1 and annexes of Table 1

Section II Chapter I § 1, 2;

Chapter III § 1 paras. 145, 183, 201-218;

§ 3, § 4, § 5;

§ 8 paras. 394-396;

§ 9 § 10 paragraphs 434-448;

§ eleven;

Chapter IV § 1 para. 553;

§ 2, § 12, paragraphs 811, 815;

§ 14 paras. 843, 853-858;

Chapter V § 1 paragraph 867;

§ 3 para. 888;

§ 4, paragraph 905;

§ 5 paras. 917, 921, 922, Appendix No. 1

- "Safety rules for operation thermal mechanical equipment of power plants and heat networks ", Tashkent 2012; in the following volume:

Chapter I

Chapter II § 1, 2, 3, 4, 6, 9, 10, 11, 12;

Chapter IV § 2 B, D, D; § 3 A, B; § 4 A, B; § 8, 9;

Appendix No. 2, 3, 4, 5, 6, 7, 10, 11, 15, 16, 17;

- "Safety rules when working with the tool and adaptations ";

- "Rules for the organization of work with personnel at the enterprises of power production" registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002.

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure" Tashkent 2011, in the amount of:

Chapter I § 1;

Chapter III § 1, 2;

Chapter V § 1, 2,

Appendix No. 3 § 1, 2;

Appendix No. 13;

Appendix No. 14;

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004, in the amount of:

Chapter I § 1, paragraphs 1, 2;

§ 2 pp. 5-8, § 3;

§ 4 pp. 11,12,14, §5;

Chapter II § 2;

Chapter III § 1, §2;

§ 3 pp. 47-53, 55, 59, 66, 70, 71, 73, 75-77, 81-85;

§ 4 pp. 86, 88-101; §7;

§ 11 pp. 265, 266, 277; §12;

Chapter V;

Chapter VI;

Chapter VII;

Appendices No. 1, 2, 8, 15, 31 (11-16), 32.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines" Tashkent 2010, in the amount of:

- "Explosion safety rules for the use of fuel oil and natural gas in boiler plants".

- "Rules for the design and safe operation of steam and hot-water boilers », Tashkent 1997, in the amount of:

Section 1

Section 2

Section 3 subsections 3.1-3.6,

Section 4 subsections 4.1-4. 7, 4.10;

Section 5 subsection 5.1;

Section 6

Section 7 subsections 7.1-7.4;

Section 8

Section 9

Section 10

Applications: 1, 3, 4.

- "Fire safety rules for energy enterprises », Tashkent 2004, in the following volume:

Chapter I § 1 par. 10-12;

§ 2 paras. 16, 20;

Chapter II § 1 paras. 52, 53;

§ 2 paras. 66-80;

Chapter III § 1 paragraph 92;

§ 2 paras. 95-97; §3;

Chapter IV § 1 paras. 110, 126-128, 134;

§ 3 paras. 156 -161, 164 -169;

§ 4 paras. 172, 174, 175, 177;

Annex 1

Section I § 1 paras. 1-9

§ 2 items 12-15, 18, 20-23.

Section II § 5 §6;

Section III § 2

Appendices No. 5, 8.

- The present job description and official instructions of subordinate operational personnel;

- KSt 202 - 036: 2007 "Rules of internal labor regulations of employees of OJSC" NTPP";

- Rules and norms of labor protection, safety precautions, industrial sanitation and fire protection;

- "Instructions for the investigation and recording of fires that occurred at energy facilities";

- "Instruction for the investigation and recording of technological violations in the operation of power plants, networks and power systems";

- "Regulations on investigation and recording of accidents on production », Tashkent 1997;

- "Instruction on rendering first aid to victims in communication with accidents in the maintenance of power equipment "

- KSt 202 - 038: 2008 "Regulations on awarding workers, managers and other plant employees for the main results of economic activity"

2. 8 The shift supervisor should know:

- The device, works and operational instructions of the main and auxiliary equipment of the CCGT unit;

- Thermal circuits of the main equipment;
- Main electrical diagrams and electrical power schemes SN CCGT - 478 MW, the principle of operation of instrumentation, signaling devices, technological protection, automation, interlocks;
- Norms for the quality of steam, water, fuel, oils;
- The territorial location of all equipment, pipelines;
- Technical and economic parameters of CCGT-478 MW and planned targets for them.

2.9 Testing the knowledge of Rules of technical operation, Rules of safety technique, Rules of fire safety should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in violation of rules and regulations, at the request of SI Sanoatkontehnazorat, SI Uzenergonadzor, higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, Rules of safety technique, production and job descriptions should be carried out at least once every 3 years.

Periodicity of Rules of safety technique knowledge testing, device rules and safe operation of equipment controlled by SI "Sanoatkontehnazorat" - once a year.

2.10 Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.11 The workplace of the shift supervisor is the control room.

2.12 The following documentation should be on the workplace of the shift supervisor:

2.12.1. Lists, schedules, lists:

- a list of works performed on orders, orders;
- List of gas hazardous works performed by orders and orders;
- list of persons entitled to issue orders, orders, orders for the production of gas hazardous works;

- List of persons entitled to be responsible for the management of work on orders, orders, general outfits, orders for the production of gas hazardous works;
- list of places of CCGT dangerous with respect to gas contamination;
- list of personnel in the unit with addresses and telephones;
- shift work schedule;
- cleaning zones of the unit area, assigned for shifts;
- phonebook.
- graph of testing TZ, AVR, interlocks.

2.12.2. The main electrical diagram of the station, the diagram of own needs of electric motors 0,4 and 6 kV.

2.12.3. Instructions for the protection of labor of operational personnel, job descriptions:

- Head of shift of CCGT;
- Senior Engineer of the power unit;
- PT operator;
- GT operator;
- the operator of auxiliary equipment;
- Engineer of GBCS;
- Patrol operator for the boiler;
- Patrol operator on the turbine;
- Patrol operator on the gas turbine;
- Patrol operator on the GBCS;

2.12.4. JOURNALS:

- operational;
- technical instructions;
- administrative orders
- Scheduled and extraordinary trainings of operational personnel;
- development of policy materials;
- accounting for work on orders and orders;

- Registration of orders for gas hazardous works;
- technical and economic indicators of the blocks.
- defects in gas turbine equipment.
- defects in the equipment of the steam turbine.
- defects in auxiliary equipment.
- starting and stopping the unit.
- circumvention of workplaces.
- temperature control of gas turbine and waste heat boiler.
- changes in technological schemes of the CCGT unit.

3 Functions and responsibilities

3.1 The shift supervisor of the CCGT, during its duty, performs general operational and technical management of the operation of the unit equipment and is the person responsible for correct, economical and trouble-free servicing of the main and auxiliary equipment, for timely and qualitative preparation of repair work, for labor and production discipline, compliance staff requirements of the rules of internal labor regulations, industrial safety, safety rules, safety rules in the gas economy, the rules of the SI "Sanoatkontehnazorat", safety rules when working with tools and devices.

3.2 The CCGT shift supervisor works according to the approved replacement schedule.

3.3 Violation of the duty schedule is prohibited. The change of shift of duty is allowed with the permission of the unit manager or his deputies, and duty for 2 consecutive shifts is prohibited. In the event that the shiftman does not come for duty, the shift head must inform the head of the CCGT about this and continue the duty until the arrival of the shift supervisor called on for duty.

3.4. Performs operational control over the provision of material and energy resources, the technically correct operation of equipment and other fixed assets, the economical use of raw materials, fuel, and materials.

3.5 Identify, prevent and eliminate the causes of violations. Carries out work on increasing labor productivity, reducing labor intensity to the cost of production.

3.6 Participates in the dissemination of advanced techniques and methods of reducing labor costs.

3.7 Analyzes the results of production activities subsections per shift; reasons that cause idle equipment; participates in the development and implementation of measures to address identified shortcomings.

3.8 Supervises the observance by employees of technological, industrial and labor discipline, rules and norms of labor protection, safety precautions, industrial sanitation and fire protection, presents proposals for imposition of disciplinary sanctions against violators of industrial and labor discipline.

3.9 The acceptance and delivery of the shift is carried out in accordance with the "Rules for the Technical Operation of Electric Power Stations and Networks".

Arrival at the workplace for 20-30 minutes before the start of the work shift in order to:

- familiarize yourself with the state of the circuit and the mode of operation of the equipment;
- to receive information from the shifting person about the equipment, for which it is necessary to strengthen control to prevent an accident or malfunctions and equipment that is under repair, reserve;
- find out what works are performed according to orders;
- check and accept operational documentation and instructions;
- read all the records and orders for the time past from the previous watch;
- accept the report from the subordinate staff and report to the Station shift head on the entry into duty and the shortcomings revealed when taking the shift;
- to register the acceptance and delivery of the shift in the operational journal for with his signature and the signature of the transferee, indicating the exact time.

3.10 Departure from duty without changing the shift is FORBIDDEN.

3.11 Acceptance of the shift during the liquidation of an emergency is FORBIDDEN.

The personnel arriving to shift are placed at the disposal of the head of the liquidation of the accident.

3.12 Prepare workplaces for repair teams in accordance with normative and technical documentation and with the permission of the station shift head.

3.13 Controls the testing of technological protections, fire, warning and emergency signaling, communication; checks the correctness of the clock in the workplace;

according to the schedule, the equipment is transferred from the working time to the standby time and performs the testing of the latter.

3.14 Increases technical knowledge, conducts technical studies with the staff, briefing; participates in the commission for the verification of knowledge staff Rules of technical operation, Rules of safety technique, Rules of fire safety, job descriptions and production instructions.

3.15 Conducts interchangeable meetings.

3.16 Duties of the CCGT shift supervisor on labor safety management system:

3.16.1 Every day, upon acceptance of the shift, by personal inspection and questioning, he checks the state of safety at workplaces, the equipment's equipment, protective equipment, interlocks and alarms.

Acquainted with the modes of conducting technological processes, records in journals, orders and instructions of the unit's management.

Gives assignments and instructions to the shift personnel for the shift period. Eliminates shortcomings that were not eliminated by the previous shift and identified during the control;

3.16.2 Regularly, at least 1 time per shift, to bypass all equipment of CCGT, paying special attention to the condition of supports, suspension, insulation of pipelines, stairs, platforms, lighting, fire fighting equipment. With regard to all the observations revealed, to make entries in the journal of defects, and also to organize their elimination by the personnel of the Center, the personnel of the shift

3.16.3 Provides maintenance of workplaces, production areas and territories in proper condition by organizing timely cleaning of equipment and communications, excluding accumulation of raw materials and materials;

3.16.4 Monitor the operation of ventilation (air conditioning) and the state of the air, take measures to eliminate gas and dust;

3.16.5 Ensures that personnel comply with changing safety requirements and applying safe work practices, maintaining technological processes in accordance with approved technological (mode) cards and instructions.

Work with the personnel all information materials of higher organizations and surveys of accidents;

3.16.6 Immediately suppresses violations of safe methods and methods of work, as well as industrial discipline.

Makes an idea of imposition of penalties on violators, removes from executing the work of persons for failure to comply with instructions related to observance of discipline and safe working methods, notifies the head of the unit about this;

3.16.7 Daily reviews the entries in the logs of reception and delivery by the senior local operators (local operators) and operators, makes in it a note and the necessary instructions for the elimination of fixed violations and deficiencies;

3.16.8. The issues, connected with the performance of works to improve the safety conditions of work, decide by himself, and if necessary with the unit manager;

3.16.9 It does not allow untrained and unverified knowledge of repair personnel for the production of works.

Provides quality training of jobs and equipment, as well as compliance with the established sequence and safety measures in the performance of work.

Does not allow the execution of works without preliminary registration of written permits (permits), if they are provided for these works, suspends also the production of the said works, if they are conducted in violation of safety rules or where circumstances that create a danger exist for workers;

3.16.10 Gives suggestions on the development and updating of instructions on labor protection for each workplace.

3.16.11 Stops the equipment in the event of an accident or fire that threatens the safety of the equipment or life of the personnel, in accordance with the instructions for eliminating emergency situations in the instructions.

3.16.12 Represent management of the unit proposals for the promotion of subordinate staff.

3.17 In the shift from 000 - 800 to prepare a report to the head of the unit, in which to indicate:

- a) the load on ST and GT;
- b) the vacuum in the condenser and the exhaust temperature of the CND.
- c) deadlines for applications for equipment repair;
- d) water reserves in BRK, DB and its quality according to chemical data. analysis;
- e) The water balance of the CCGT: the recharge rate,
- f) basic defects in the equipment of the unit, blocks.
- g) deviations from the TEP norms, the water-chemical regime of the block and the generator;

- h) remarks (encouragement) to the staff.
- j) condition of the smart - admission system;
- l) equipment under repair;

3.18 Change of Shift is not allowed:

- a) during the elimination of accidents.
- b) with contaminated equipment.
- c) in the time of switching operations or the operation of switching on and off the equipment.
- d) if the normal operating mode of the equipment is disrupted.
- e) in exceptional cases, the delivery of a change during the liquidation of an accident is allowed with the permission of the management of the unit or the chief engineer.
- f) when the duty personnel enter the work in an incapacitated state.
- g) the delivery of a shift in case of violation of the equipment operation mode, during start-up and shutdown is allowed with the permission of the unit manager or his deputy.

3.19 During the production of repair work, the shift manager of the CCPP:

- a) organizes the preparation of equipment for repair within the time specified in the attire or order, ensures the completeness of the fulfillment of the conditions for the production of work.
- b) determines the amount of equipment remaining in the work area of the outfit.
- c) instructs the responsible manager and the fulfiller of work on safety measures in the production of work and determines the work area of the team.
- d) makes an admission and completes the work for the CCGT equipment in accordance with the "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks".
- e) prohibits admission to work if the responsible manager or server of work does not have a certificate of verification of Rules of safety technique knowledge or expiration of its validity;
- f) provides periodic monitoring of working teams;
- g) removes the team from work in case of detection of violations of the Rules of safety technique or expansion of the zone of work by the members of the brigade;

- h) organizes the acceptance of workplaces for cleanliness after the completion of work;
- i) organize testing of equipment and subsequent withdrawal to the reserve or work;
- j) takes part in the acceptance of equipment from the installation;
- l) draw up admission, end of work on orders and orders in the register of work on orders and orders;
- m) makes an admission, with the permission of the station shift supervisor, to testing by order of the unit manager or the program approved by the technical manager;
- n) makes a record in the operational journal about his admission to the order, indicating the number of the order, place of work and time of admission;
- o) renews the local application for equipment under repair for the period necessary to complete the work for the identified additional work in the process of equipment repair;
- p) closes local applications upon completion of equipment repair and testing. The withdrawal of equipment from repair to a reserve without testing is prohibited;

3.20. In case of emergency:

An emergency situation means a violation of the normal operation of equipment or individual units, which, if not taken timely, creates a threat to the safety of equipment, the uninterrupted operation of the station, and the safety of people.

Liquidation of the emergency situation in the CCGT is carried out under the supervision of the shift supervisor.

The shift supervisor must arrive at the site, the facility where the emergency situation was created, find out the nature and size of the accident, identify the cause as soon as possible and take measures to eliminate the accident, report the incident to the station shift supervisor and the unit manager.

In the event of accidents related to load limitation, damage to equipment, fire requiring a fire department call, accidents, immediately report to the unit management. If at the time of the accident any repair work or testing was carried out, they should be immediately suspended and people withdrawn from the danger zone.

In case of an emergency situation, except for the personnel participating in the liquidation of the accident, the equipment has unimpeded access to the equipment: the management of "NTPP", the management of the CCGT, Electrical

unit, TAI unit. All other personnel must be removed from the main control room and the accident site.

During the development of the accident, the shift supervisor supervises the actions of the subordinate personnel, gives instructions on taking the necessary measures for the successful liquidation of the emergency situation, the safety of people, the safety of equipment, the fulfillment of the load dispatch schedule, guided by the job description and production instructions, and in case of an unusual situation, makes decisions independently, depending on the specific situation.

If the emergency situation was created during the acceptance-delivery of the shift, all personnel who arrived to the shift are placed at the disposal of the head of the liquidation of the accident. Delivery of the shift during the liquidation of the accident is allowed only with the permission of the unit's management.

4 Relationships

4.1 The CCGT shift supervisor performs all administrative and technical orders of the unit manager, the deputy head of the equipment on operation, the leading process engineer, the operative orders of the shift supervisor.

In case of disagreement with the received order of the station shift supervisor, the CCGT shift supervisor should state this to the person who gave the order, but after receiving the confirmation of the order, it executes it if it does not harm the safety of the personnel or the safety of the equipment.

4.2 In case orders are received directly from the director, chief engineer or from another administrative person of the power plant, the shift supervisor of the CCGT executes it and notifies the shift supervisor of the station.

4.3 In operational telephone conversations with personnel, first of all, he names his position and surname, and then transmits or receives orders or messages.

4.4 If necessary, requires additional or more frequent monitoring of the chemical regime of the equipment through the head of the unit chemical mode.

Coordinates with the head of shift chemical unit all the switching on the pipelines of demineralized, raw and tap water, contaminated condensate and washing solutions after acid washing of the equipment at the COPS.

4.5 Gives the senior duty officer of the TAI unit on thermal automation and measurements directly or through subordinate personnel instructions for performing work not related to the input or output of protection or connected with

the necessity of the output of any protection in emergency order due to the appearance of a defect on the devices of thermal automation and measurement.

4.6. Provides the senior duty technician at the TAI unit with regard to the thermal automation and measuring the instructions for entering or leaving the protection of the process equipment when starting or stopping it. These instructions are preliminarily agreed with the shift supervisor.

4.7 With the knowledge of the station shift supervisor, he gives instructions to the senior electrician on duty to assemble and disassemble the electrical circuits of the drives of non-compliant mechanisms.

4.8 With the knowledge of the station shift supervisor, the head of the shift of the electrical unit requires the assembly or disassembly of the electrical circuits for the drive of the responsible mechanisms.

4.8 In emergency cases, it requires the station supervisor to take measures to maintain pressure in the collectors of the gas pipeline of the station, raw and tap water.

5. Rights

5.1. The shift supervisor of the CCGT has the right to demand healthy and safe working conditions, as well as proper technical equipment of the workplace.

5.2. With the permission of the Station shift head, give instructions to the senior operational personnel of other unit on the procedure for maintaining the operating mode of the equipment.

5.3. Involve through the Station shift head for the production of repair work for the staff of the Central Repair Unit.

5.4. Load the shift staff with current business and production work.

5.5. To take part in the decision of questions on rearrangement of personnel in the shift.

5.6. To suspend from duty the subordinate staff, who do not ensure the performance of their duties, who violated the Rules of technical operation, the Rules of fire safety, Rules of safety technique, etc.

5.7. To abolish orders given by subordinate personnel.

- 5.8. In agreement with the Station shift head, authorize the withdrawal in repair of auxiliary equipment, not connected with the reduction of the load, for the duration of their watch.
- 5.9. In order to eliminate the emergency situation in the unit, all operational personnel and repair personnel of the shift, as well as the personnel of the host shift.
- 5.10. To apply to the administration of the unit for the encouragement and punishment of shift personnel.
- 5.11. In case of disagreement with the received order, the shift head has the right to appeal against it to the higher management, without suspending its execution, if this does not threaten damage to equipment and people's lives.
- 5.12. Select the attire from the manufacturer of work in case of detection of violations of the Rules of safety technique, or identify other circumstances that threaten the safety of workers and remove the team from their place of work.
- 5.13. Require the heads of shifts Electrical unit, and the unit of TAI to eliminate defects affecting the operation of CCGT equipment.
- 5.14. Do not comply with orders that contradict the requirements of Rules of technical operation, Rules of safety technique, Rules of fire safety, or pose a threat to the safety of people or the safety of power equipment.

6 Responsibility

- 6.1 The head of the shift unit of the CCGT must comply with the requirements of the current legislation in the activities of subordinated personnel.
- 6.2 The shift supervisor of the CCGT is responsible for:
- untimely and substandard performance of the assigned functions,
 - not use of the granted rights;
 - failure to comply with the job description;
 - all cases of violations in the operation of process equipment, committed by him or directly subordinate to him personnel, performing work on his instruction (order).
 - Injury and tanning caused by his fault or fault subordinate staff;
 - organization of safety of the serviced equipment.
 - late exams.

- the state of labor, production and technological discipline in the shift.

6.3 The head of the shift unit of the CCGT is involved to disciplinary, administrative and other measures of liability for non-fulfillment or improper performance of their functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202- 817:2015

Information data

Designed by The unit of the CCPP of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T. Kh. Soliev

Planning and Economic Department

Head of the department

E.E.Davova

Reliability and Industrial Safety Service

Head of the department

Kh. O. Muminov

Legal adviser

Sh. Y. Nazarov

Responsible for Standardization

N. S. Nurullaeva

KSt 202- 817:2015

COMPANY STANDARD

**JOB DESCRIPTION OF
SENIOR OPERATOR OF THE CCPP UNIT**

Preface

- 1 DEVELOPED AND INTRODUCED by the CCPP UNIT of JSC "NTPP"
- 2 APPROVED AND INTRODUCED by the Order of JSC "NTPP"
No. dated
- 3 INTRODUCED FOR THE FIRST TIME

Approved by

Chief engineer of JSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

**JOB DESCRIPTION OF
SENIOR OPERATOR OF THE CCGT UNIT**

Valid from _____ to _____

1 Application area

This job description is developed on the basis of KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Unified tariff and qualification reference book of jobs and occupations of workers in order to regulate the functions, duties, rights and responsibilities of the senior operator of the power unit of the CCGT unit and is mandatory for him.

Should know instructions:

- Senior operator of the CCGT Unit
- the head of the CCGT shift,
- Head of the GBCS section
- station shift supervisor
- Engineering technical personnel of the CCGT.

2 General terms

2.1 The senior operator of the power unit of the CCGT is a person in charge of the operational management of his subordinate personnel, providing safe, reliable and economical operation of equipment assigned to the CCGT unit and GBCS, organization of switching in the technological schemes of auxiliary equipment CCGT and equipment of the GBCS section, as well as compliance with the personnel of the CCGT and GBCS replacement of duty and production instructions, Rules of Technical Operation, Safety Rules, Fire Safety Rules, Labor and Industrial Discipline, Rules of Internal Labor Regulations.

2.2 The senior operator of the power unit of the CCGT unit must be at least 18 years old, having a higher or secondary technical education and a practical experience of work at the CCGT not less than 3 years old, having undergone a medical examination.

Before the assignment to independent work, the senior operator of the power unit must:

2.3.1 Undertake production training, according to the individual training program.

2.3.2 Pass the examinations of the qualification commission under the chairmanship of the chief engineer or his deputy for operation, in the amount of necessary knowledge for the senior operator of the power unit, in accordance with the Rules of the organization work with personnel at energy production enterprises, registered by the Ministry of Justice R.Uz of 04.10.2010, No. 1178 .

2.3.3 After passing the examinations, the senior operator of the power unit of the CCGT unit must undergo duplication at the workplace of the senior operator of the power unit of the CCGT unit for a period of not less than 12 shifts, under the supervision of an experienced senior operator of the power unit of the CCGT unit. After the end of the period of duplication and with a positive evaluation of the emergency response training, the senior operator of the power unit of the CCGT unit is allowed to work independently by ordering the unit.

2.4 The senior operator of the power unit of the CCGT unit is appointed, moved and dismissed from the position by the director of the enterprise upon presentation of the head of the unit of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.5 The senior operator of the power unit of the CCGT unit is administratively and technically subject to the unit manager and his deputies, the leading process engineer of the CCGT, and to the operational head of the CCGT replacement.

The senior operator of the power unit of CCGT was promptly subordinated to operators and patrol-operators for servicing the CCGT equipment and GBCS.

For the time of the absence of the senior operator of the power unit of CCGT, he is replaced by the shift supervisor of the CCGT.

2.6 The senior operator of the power unit of CCGT should know and be guided in its work:

- Indication of PP-56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline ";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 as of 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011;
 - Section I Chapter I;
 - Section II Chapter I;
 - Chapter II §4;
 - Chapter III §1 paragraphs 201-218, §3, §4, §6, §7, §8, §9, §11, §12, §13;
 - Chapter IV §1, §2, §10, §12, §14;
 - Chapter V §1, §4-6, §7;
- "Safety technique on operation of thermal mechanical equipments on power stations and heat networks", Tashkent 2012, in the following scope:
 - Chapter I;
 - Chapter II;
 - Chapter III §§1-7; §§9-14;
 - Chapter IV §2 B, D, D, §3, §4, §6, §8, §9;
 - Appendices 2-8, 10, 11, 13-17, 19.
- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", approved by agreement with the Ministry of Justice of the Republic of Uzbekistan, assigned to technical documents December 23, 2011, No. 6-24 / 11-13112 / 6;
- "Fire safety rules for an energy company", Tashkent 2004;
- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent-2004, in the following volume:
 - Chapter I § 1, §2;
 - Chapter III §1, §2, §3, §4, §7;
 - Chapter VI;
 - Appendices 1, 2, 31, 32.

- "Instruction on fire safety measures for fire works at power facilities";
- "Explosion safety rules for the use of gas, fuel oil in boiler plants";
- "Safety rules when working with tools and devices";
- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";
- The present job description and job descriptions of the subordinate staff;
- "Instructions for first aid to victims in connection with accidents in the service of power equipment."

2.7 The senior operator of the power unit of the CCGT should know:

- The device, operation and operational instructions of the main and auxiliary equipment of the GBCS section;
- Technological and general technological schemes of equipment CCGT and GBCS(Gas boosting compressor station);
- Main electrical diagrams and power supply circuits for auxiliary needs of CCGT equipment;
- Purpose and principle of operation of instrumentation, signaling device, technological protection, automation, interlocks;
- Norms of quality of gas, fuel, oils;
- The territorial location of all equipment, pipelines, fittings and structures of the CCGT and the GBCS section;
- Technical and economic indicators of the CCGT unit and planning targets for them;
- Theoretical fundamentals of heat engineering, general electrical engineering, mechanics and water treatment, fundamentals of electronics, ACS TP;
- Operating mode of the CCGT unit and GBCS equipment;
- The device, operation and technical characteristics of the main and auxiliary equipment of the CCGT unit and CCGS; production instructions for start-up, shutdown, operation of boiler equipment and elimination of emergency situations in the work of CCGTs and GBCS, as well as instructions of other units related to the equipment being serviced.

2.8 Testing the knowledge of Rules of safety technique, Rules of technical operation, Rules of fire safety, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in case of violation of rules and instructions, at the request of the state supervision bodies, the State Inspectorate for the operation of power plants and networks and higher management bodies, as decided by the special commission.

Periodic testing of knowledge of Rules of technical operation, Rules of fire safety, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of Rules of safety technique knowledge, rules of the device and safe operation of equipment controlled by the Agency "Sanoatkontehnazorat" once a year.

2.9 The workplace of the senior operator is the operator's building CCGT.

2.10 The service area of the senior operator is all the technological equipment assigned to the CCGT unit and to the GBCS site.

3 Functions and responsibilities

3.1 The senior operator of the power unit of the CCGT conducts general operational and technical supervision of the operation of the unit's equipment and is the person responsible for the correct, economical and trouble-free servicing of the main and auxiliary equipment; for timely and qualitative preparation of repair work, for labor and production discipline on the unit, compliance with subordinate personnel requirements of internal labor regulations, industrial sanitation.

3.2 The senior operator of the power unit of the CCGT works according to the approved schedule.

3.3 Getting to work should take a shift from the previous senior operator, and after the end of the work to pass the next shift according to the schedule to the senior operator.

3.4 Violation of the schedule of duty is FORBIDDEN.

3.5 Substitution of duty is allowed only with the permission of the unit manager or his deputies, and duty for two shifts in a row is PROHIBITED.

3.6 In the event that the shiftman is not on duty, the senior operator of the power unit of the CCGT must inform the shift head about this, continue the duty until the arrival of the senior operator of the power unit of the CCGT, called for duty.

Departure from duty without changing the shift is FORBIDDEN.

3.7 When accepting shifts, the senior operator must:

- To get acquainted with the status, the scheme and the regime of operation of power plants in its operational management or management, in its operational management or management, in the amount determined by the relevant instructions;
- To receive information from the shifting about the equipment, for which it is necessary to conduct especially careful monitoring, to prevent violations in work and equipment that is in reserve and repair;
- To find out what works are performed according to orders on the area assigned to it:
 - Check and accept tools, materials, room keys, on-line documentation and workplace documentation:
 - To get acquainted with all the records and orders for the time elapsed since

your previous watch:

- To accept the report from the subordinate staff and report directly to the shift supervisor on the entry into duty and the shortcomings revealed during the acceptance of the shift:

- Make a receipt-delivery shift in a record in a journal or in a statement for his signature that passes the shift.

Acceptance and delivery of the shift during the liquidation of the accident is FORBIDDEN.

- The operative personnel replaced are used at the discretion of the person guiding the liquidation of the accident.

3.8 Under the supervision of the shift supervisor, the general technical and operational management of the operation of the CCGT equipment and the GBCS section is carried out during its stay.

3.9 If the subordinate operational personnel violates the rules of internal labor regulations, labor discipline, Rules of technical operation, Rules of fire safety, Rules of safety technique, or failure to comply with his instructions, is obliged to file a report to the head of the unit shift or to the head of the CCPP on imposing a penalty on the perpetrator.

3.10 The senior operator of the power unit is obliged to take measures to reduce soaring, condensate leaks, oil leaks and fire-resistant liquids, and require repair personnel to repair defects.

3.11 Controls directly and through subordinate personnel at the work and state of the equipment of the GBCS site.

3.12 Provides reliable and economical operation of the CCGT equipment and the GBCS section.

Periodically, in accordance with the instruction, it tests the operation of technological, fire, warning and emergency signaling, communication equipment, and also checks the accuracy of the clock in the workplace.

3.13 According to the approved schedule, the equipment is transferred from the worker to the standby state, performs testing and preventive inspections of the equipment.

3.14 Organize subordinate personnel to maintain workplaces and equipment of CCGT and GBCS site in a clean state.

3.15 Senior Operator of the CCGT during the shift:

- Checks the cleanliness and order of workplaces, serviceability of equipment, tools, safety and protective devices, protective equipment, instrumentation and so on;
- Supervises the use of each subordinate worker's issued uniforms, special footwear, required personal protective equipment;

- DO NOT let unauthorized persons to the serviced site;
- Monitor compliance with those working for CCGT and the site of the GBCS safety regulations, instructions for the safe conduct of the technological (production) process;
- IMMEDIATELY suppresses violations of rules and regulations that ensure the safety of employees, safety and serviceability of equipment;
- Reports to his immediate supervisor on the detected malfunctions of equipment, devices, as well as on the appearance of abnormalities and process management or in the performance of an operation that could lead to an accident (fire) or to reduce work safety; about each case of injury, poisoning, burn of workers at the site served by him or near this site.

3.16 It monitors during the shift the operation of all CCGT equipment, compressors and its auxiliary equipment, their vibration state; temperature of electric motors of pumps, their bearings; condition of stuffing box seals of pumps, fittings; condition of oil lines for leaks; operation of gas cooling fans; temperature regime of the bearings of the compressor unit.

3.17 When the equipment is traversed during the shift, the senior operator checks the equipment operation mode according to the control devices, the maintenance of the documentation by the operators of the gas-compression compressor unit; reveals defects, malfunctions in the operation of equipment, if necessary, promptly fixes problems with the help of subordinate personnel.

3.18 During rounds, the senior operator is obliged to reveal the correctness application of the established system of work-permits in the performance of repair work and work on orders; check the condition of the fire safety equipment.

3.19 The results of the patrol are processed by the senior operator in the operational journal of the senior operator, defects in the defect log and reports to the head of the shift of CCGT.

3.20 Participates in the implementation of operations for starting, stopping, testing, crimping, as well as the distribution of thermal and electrical loads.

3.21 Participates in the production of switching in technological schemes of CCGTs and GBCS.

3.22 Carries out revealing and elimination of malfunctions of the equipment of CCGT and GBCS site.

3.23 Participates in the preparation of workplaces and the admission to repair and commissioning works.

3.24 The Senior operator of the Unit of the CCGT is obliged:

- To raise the level of their technical knowledge by attending organized training courses for workers, schools for studying advanced working methods, participating in training exercises;
- Participate in competitions;
- A senior operator of the power unit of the CCGT can be used as a operator of

the GBCS after redundancy and briefing;

- Organizes first aid to the victim and immediate call of ambulance;
- Carries out the admission on implementation of works.

3.25 When a senior operator appears at the workplace, the management of JSC "NTPP", the unit manager and his deputies, reports on the condition of the equipment assigned to it: load on the unit, main TEPs, deviations from the equipment operation schedule; basic defects in equipment, equipment under repair, which equipment and parts of the schemes are allowed to repair personnel, and for what repairs.

3.26 When starting CCGT and GBCS shall:

3.26.1 Verify the closure of all orders and orders for the repair of CCGT equipment and GBCS.

3.26.2 Check equipment for fire safety compliance.

3.26.3 Bring to the subordinate personnel the tasks of the Station shift head on the unit start-up regime.

3.26.4 Manage the launch of the GBCS, supervising the execution by the subordinate personnel of the start-up instructions of the unit, the start-up schedule.

3.27 During the production of repair work, the senior operator of the CCGT must:

3.27.1 With the permission of the Station shift head, organize the withdrawal of equipment for repairs by the time specified in the order, ensure the completeness of the fulfillment of the conditions for the production of work, determine the amount of equipment remaining in work in the area of the work order. To instruct the chief of work on safety measures in the course of work and to determine the work area of the team.

3.27.2 With the permission of the STATION SHIFT HEAD, authorize and complete the work on the equipment of the unit in accordance with the Safety Regulations for the operation of thermal mechanical equipment of power plants and heating networks.

3.27.3 BANNER admission to work in the absence of a responsible manager or manufacturer of work certificates for checking Rules of safety technique knowledge or expiration of their validity.

3.27.4 Ensure periodic monitoring of working teams.

3.27.5 Remove the brigade from work in case of detection of violations of the Rules of safety technique or the expansion of the zone of work by the members of the brigade.

3.27.6 Arrange acceptance of workplaces for cleanliness after completion of work; organize testing of equipment and subsequent withdrawal to the reserve or work.

3.27.7 To participate in the acceptance of equipment from installation.

3.28 Participates in the elimination of emergency situations.

3.29 Actions of the senior operator in the event of emergency response:

3.29.1. An emergency situation means a violation of the normal operation of equipment or individual units, which, if untimely measures are taken, threatens the safety of the equipment, the uninterrupted operation of the station, and the safety of people.

3.29.2 Liquidation of the emergency situation on the unit is carried out under the guidance of the STATION SHIFT HEAD, in its absence under the supervision of the senior operator.

3.29.3 In the event of the liquidation of an emergency, the senior operator must ascertain the nature and extent of the emergency situation.

3.29.4 Monitor and coordinate the actions of subordinate personnel, and if necessary, provide direct assistance to personnel in the elimination of the accident. Decide on the adoption of the most favorable measures for the successful liquidation of the emergency situation, the safety of people, the safety of equipment, the fulfillment of the dispatch schedule of the load, guided by official and production instructions. And in the event of an unusual situation, make decisions independently, depending on the specific situation.

3.29.5 Report on the measures taken to eliminate the emergency situation to report to the head of the CCGT shift

3.29.6 If, at the time of the occurrence of an accident, any repairs or tests have been carried out, they must be discontinued immediately, people are withdrawn.

3.29.7 In emergency situations, except for the personnel involved in the elimination of the accident, the equipment has unimpeded access:

- management of JSC "NTPP";
- supervising staff of the CCGT and GBCS;

All other personnel should be removed from the main control room and accident areas.

3.29.8 If the emergency situation was created during the acceptance-delivery of the shift, all the personnel of the receiving shift are placed at the disposal of the head of the liquidation of the accident.

3.29.9 In case of accidents with people, IMMEDIATELY inform the shift head, the management of the CCGT, to call an ambulance if it is necessary to provide first aid to the victim, involving a number of people.

3.29.10 Do not interfere with the operation of automatic devices, unless instructed to do so;

3.29.11 Ensure normal operation of the main equipment remaining in operation.

3.29.12 Find out the location, nature and extent of the damage and disconnect the damaged equipment. On what happened to report to the head of the CCGT shift.

3.30 It is forbidden to engage in strangers during business hours, not related to the performance of official duties by affairs.

4 Rights

4.1 Give operational orders to subordinate personnel.

4.2 Remove subordinate personnel who do not fulfill their duties, as well as in case of gross violations of Rules of technical operation, Rules of safety technique or internal labor regulations of the station, while notifying the Shift head of CCGT.

4.3 Stop the equipment in the event of an accident or fire that threatens the safety of the equipment or the life of the personnel in accordance with the instructions for the elimination of emergency situations.

4.4 To involve all the operational shift staff, as well as the personnel of the host shift, in order to eliminate the emergency situation in the unit.

4.5 Do not follow orders that are contrary to the requirements of Rules of safety technique, Rules of technical operation or pose a threat to human security or safety power equipment, appeal other disagreements in the event of disagreement, without suspending their execution.

4.6 Represent the management of the unit through the head of the CCGT shift of the proposal on the promotion of subordinate personnel or the imposition of penalties on him.

5 Relationships

5.1 The Senior operator of the CCGT unit, during his duty, performs the administrative and technical orders of the unit manager, his deputies, the leading process engineer and operational orders from the shift supervisor of the CCGT or the station shift supervisor.

In the event that orders are received directly from the management of OJSC "NTPP", it executes the order with the subsequent notification to the head of the unit shift.

5.2 The senior operator of the power unit of the CCGT unit accepts and replaces the substitute senior operator of the CCGT.

With administrative orders, the senior operator of the GBCS site is to be consulted in the journal of administrative orders of the CCGT unit.

Communication with operational staff of other units, the senior operator of the power unit of the CCGT, leads through the shift supervisor of the CCGT.

The senior operator of the power unit of the CCGT is contacted by the station shift head to maintain the specified pressure in the main gas pipeline.

5.3 In operational telephone conversations with personnel, first of all, he names his position and surname, and then transmits or receives an order or a message.

5.4 Upon receipt of the order, he must repeat it, execute and report on the execution to the person who issued the order. In case of disagreement with the received order, the senior operator of the unit of the CCGT should reasonably object, but upon receipt of a repeated order to execute it. It is not allowed to carry out orders that could lead to equipment damage, as well as contradicting Rules of safety technique.

5.5 Disagreements that have not found a common solution may be resolved by the "Labor Disputes Commission".

6 Responsibility

6.1 The senior operator of the power unit of the CCGT is personally responsible:

- For all cases of violations of Rules of technical operation, Rules of safety technique, Rules of fire safety, production and this instruction, accidents, incidents of fire, occupational accidents occurred due to his fault and through the fault of subordinate personnel;
- For failure to comply with orders of higher-level operational personnel;
- for safety of the serviced equipment;
- For violation of labor, production and technological discipline;
- For the performance of duties and use of the rights provided for by the job description;
- For damage caused to the environment caused by personal actions or violation of operational instructions;

6.2 The senior operator of the power unit of the CCGT must observe compliance in the activities of subordinate personnel with the requirements of the current legislation.

6.3 The senior operator of the power unit of the CCGT, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility in accordance with the current legislation of the Republic of Uzbekistan.

Informational data

Developed by	CCGT Unit of OJSC “NTPP”
Head of unit	I.Kh.Abdulloev
Agreed	
Production and Technical Department	
Head of the department	T.H.Soliev
Planning and Economic Department	
Head of the Department	E.E.Davov
Service reliability of machinery and industrial safety	
Head of the service	Kh.O. Muminov
Senior Inspector for Labor Protection and Technology security	T.K.Djumanazarov
Legal adviser	Sh.Y.Nazarov
Responsible for standardization	O.L. Zelenskaya

STANDARD OF THE ENTERPRISE

JOB INSTRUCTION
OF THE OPERATOR OF GAS TURBINE OF THE WORKSHOP
OF THE COMBINED CYCLE GAS TURBINES

Open Joint Stock Company NTPS
Navoi

Foreword

1. ELABORATED AND SUBMITTED by the Workshop of the Combined Cycle Gas Turbines of the Open Joint Stock Company NTPS
2. APPROVED AND ENFORCED by the Order of the Open JSC NTPS date _____ No. _____
3. INTRODUCED FOR THE FIRST TIME

Approved
Chief Engineer of Open JSC NTPS

/signature/ T.G. Nazarov

STANDARD OF THE ENTERPRISE

JOB INSTRUCTION
OF THE OPERATOR OF STEAM TURBINE OF THE WORKSHOP
OF THE COMBINED CYCLE GAS TURBINES

Validity period from 01.07.2012 to 01.07.2015

1. Field of application

The present Instruction is elaborated on the basis of the KSt 202-810:2011 "Regulations on the workshop of the combined cycle gas turbines", Unified tariff-qualification reference book of the works and professions of the workers, for the purposes of regulation of the functions, obligations, rights and responsibilities of the operator of gas turbine of the workshop of combined cycle gas turbines (CCGT) and is obligatory for him.

Head of the shift of the CCGT, Head of the CCGT and his deputies, Engineers technologists of the CCGT, head of the shift of the power plant are obliged to know the Instruction.

2. General Provisions

2.1. Operator of gas turbine of the workshop of combined cycle gas turbines is the person, who ensures reliable, safe and economic operation of the gas turbine of the combined cycle gas turbine with the capacity of 478 MW with all its auxiliary equipment.

2.2. Persons not younger than 18 years, with general secondary education, who have passed medical examination, specially trained, systematically briefed, passed examination of the qualification commission, who have certificates and passed training and duplication in accordance with the Rules of organization of the work with the personnel at the enterprises of the energy generation, registered by the Ministry of Justice of the Republic of Uzbekistan dated 04.10.2002 No. 1178 are accepted to the position of the operator of gas turbine of the combined cycle gas turbine.

2.3. Operator of gas turbine of the CCGT is assigned to his position, transferred to other position and dismissed from the position by the order of the Director of the enterprise upon proposal of the Head of the CCGT workshop, Human Resource Department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3. Operator of gas turbine of the CCGT from the production-technical and administrative point of view is subordinated to the Head of the CCGT workshop and deputy head of the workshop on operation of equipment, while in the operational aspects he is subordinated to head of the shift of power plant, head of the shift of the CCGT workshop.

Operator of gas turbine of the CCGT has under his operative subordination operators-inspectors on gas turbine and boiler equipment.

2.5. Operator of gas turbines of the CCGT shall be aware and follow in performing his duties the followings:

- Instruction RR-56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated 12.01.1999 No. 140 "On the measures aimed on strengthening the operational discipline"
- Law of the Republic of Uzbekistan "On Electric power" No. 225 dated 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated 22.08.2009 "On Approval of the rules of using the electric and heat power";
- "Rules of the Installation and safe operation of the vessels operating under pressure": Tashkent 1997;

- "Rules of design and safe operation of the pipelines of steam and hot water" 1992;

- "Rules of technical operation of the power plants and networks of the Republic of Uzbekistan", Tashkent 2005, in the following scope:

Section I Chapter 1;

Section II Chapter 1;

Chapter 2. §4;

Chapter 3. §1, 3, 4, 5, 7, 8, 9, 12, 13;

Chapter 5.

- "Rules of Safety measures in operation of the heat mechanics equipment of the power stations and heating networks" 1985, in the following scope:

Section 1;

Section 2;

Section 3 Subsection 3.1; (E, F); 3.2 (C, D, E); 3.3 (A); 3.6, 3.7, 3.8;

Section 4;

Annexes 1-12;

- Rules of safety in the gas sector of the Republic of Uzbekistan, Tashkent – 2004, in the following scope:

Chapter I;

Chapter II §2;

Chapter III §1, 2, 3, 4, 7, 8;

Chapter IV;

- Annexes 1, 31.

- "Rules of design and safe operation of the pipelines of steam and hot water" 1992;

- "Rules of design and safe operation of the steam and water heating boilers", Tashkent 1997;

- "Rules on fire safety for the power enterprises", Tashkent 2004;

- "Rules of explosion safety in using the mazut and natural gas in the boiler units".

- the present job instruction and instructions for the operator inspectors on the boiler and turbine equipment;

- KSt 202-036-2007 "Rules of internal labor policy of the workers of the Open Joint Stock Company "NTPS"";

- "Rules of safety in working with the instruments and devises";

Sections 3, 4, 5

- "Instructions on rendering first aid to the injured persons in connection with the accidents in the process of servicing the energy equipment";

- "Instructions on investigation and accounting of the technological violations in the operation of the power stations, networks ad power grids"

- "Instructions on conservation of the drum boilers of high pressure in the regimen of their shutdown".

- KSt 202-032:2008 "Rules of operation with the low sulfur gas".

- RH 34-400:2008 "Regulations on the system of management of the labor safety in the power sector".

- Model instructions on operation of fast-response pressure-reducing and desuperheating station, pressure-reducing and desuperheating station.

2.7. Operator gas turbine of the CCGT shall know followings:

2.7.1. Design and principle of operation and technical specifications of the boiler utilizer, gas and steam turbines, generators, transformers, gas boosting compressor station, cooling tower and balance of plant.

2.7.2. Heat protections and their operation.

2.7.3. Heat circuits and technological process of production of heat and electric power.

2.7.4. Regimen of loads of the power unit of CCGT.

2.7.5. Principal electric circuit of the generators and own needs of the block of CCGT.

2.7.6. Designation and principle of operation of the controlling and measurement devises, alarms, automatics, block ups and regulators.

2.7.7. Norms of quality of the steam, water, fuel and lubricants.

2.7.8. Territorial layout of all equipment, pipelines, valves and facilities.

2.7.9. Technical and economic indicators of the CCGT and planned assignments on them.

2.7.10. Basics of the heat engineering, electric engineering, mechanics and water treatment.

2.8. Examination on the knowledge of the technical operation rules, safety rules, fire safety, job instructions and industrial instructions shall be carried out as follows:

- initial – before granting the permission to the independent operation;

- periodical – within the set periods;

- unscheduled – in case of violation of the rules and instructions, upon the request of the bodies of the State Control, State Energy Inspection, higher bodies of management in accordance with the decision of the special commission.

Periodical examination for the knowledge of the Operation Rules, Fire Safety Rules, industrial and job instructions shall be carried out not later than once in 3 years.

Periodicity of the examination of the knowledge of the safety rules, rules of installation and safe operation of the equipment, supervised by the State Inspection "Sanoatgeokontehnazorat" is as follows: for

the persons, directly connected with the operation and servicing the power units, as well as for the workers of all categories once a year.

2.9. Working place of the operator of gas turbine of combined cycle gas turbine is located in the building of the electric department of the 478 MW CCGT

2.10. Servicing zone of the operator of gas turbine of the combined cycle gas turbine is gas turbine of the combined cycle gas turbine with auxiliary equipment (gas pipeline within the area of the CCGT, heater of the gas, air filter, air cooler and etc.).

3. Functions and duties

3.1. Operational servicing of the gas turbine of the combined cycle gas turbine and ensuring its continuous and economic operation.

3.2. At the time of taking over of the shift operator of the gas turbine of combined cycle gas turbine is obliged:

- to get familiarized with the status, circuit and regimen of the operation of the power units, under his operative management, within the scope determined by the corresponding instructions;
- to receive information from the person who is handing over the shift about the equipment, which shall be especially thoroughly observed, for the purposes of preventing the disturbances in the operation, and about the equipment, which is in the reserve and in repair;
- to clarify what kind of works is in process in accordance with the orders and instructions at the areas assigned to him;
- to examine and accept the fire hose, protection means, which are stored at Unit switchboard, operative documentation and documentation of the working place;
- to get familiarized with all records and instructions for the period, passed from the previous period of duty;
- to receive report from the subordinated personnel about takeover of the shift and on shortcomings, revealed at the time of taking over the shift and hand over the report to the head of the shift of CCGT;
- to register the takeover-handover of the shift by the records to the bulletin with his signature and the signature of the person handing over the shift.

Leaving the shift without handover of the shift is PROHIBITED.

3.3. Start up and shut down, testing, pressure testing of the equipment.

3.4. Switching in the heat and electric circuits of the power unit of CCGT.

3.5. Shutdown of the gas and steam turbine generator and switching the supply of the own needs from the main to reserve and vice versa (in emergency situations).

3.6. Control of the indicators of the measurement devises, operation of the auto regulators and alarm system.

3.7. Revealing defects in the operation of the equipment and undertaking measures aimed on their elimination.

3.8. Operator of the gas turbine of the combined cycle gas turbine in case of the emergency situations and liquidation of the emergencies is obliged:

- to compile general picture of what happened in accordance with the indicators of the alarm devises and external signs;

- to eliminate the hazard for the personnel and equipment, up to disconnecting it, is necessity will arise;
 - do not interfere to the operation of the automatic devises;
 - to ensure normal operation of the main equipment which is in operation; as well as mechanisms of own needs of the CCGT;
 - to identify the place, character and volume of the damages and to shut down damaged equipment;
 - switched down in the process of emergency equipment shall be started up immediately after clarifying and elimination of its malfunctions, upon the order of the head of the shift of the CCGT workshop;
 - on each operation on liquidation of the emergency the operator steam turbine is obliged to report to the head of the shift without waiting for the inquiry.
- 3.9. Management of the subordinated workers (operator-inspectors).
 - 3.10. Preparing the working place for repair;
 - 3.11. Raising technical knowledge, participation in the training.
 - 3.12. Maintaining cleanness of his working place.
 - 3.13. Rendering first aid to the injured person.
 - 3.14. Free from the duty operator of gas turbine may be used by the instructions on the workshop as operator-inspector after duplication and briefing.

4. Rights

- 4.1 To give operational orders to the subordinated personnel and check their implementation;
- 4.2. To stop equipment in case of emergency or fire, threatening the safety of the equipment or life of the personnel.
- 4.3. Submit to the management of the workshop through the head of the shift of CCGT proposals on stimulation of the subordinated personnel or on imposing penalty to the personnel.
- 4.4. Suspend the works and remove all persons from the working place, who hinder normal operation of the equipment.
- 4.5. Do not fulfill the orders, which contradict to the requirements of the rules of technical operation of power plants and networks, rules of safety measures, fire safety rules or threaten the safety of the people or equipment.
- 4.6. Lodge a complaint in case of disagreement against the other orders, without suspending their fulfillment.

5. Interactions

- 5.1. Operator gas turbine of combined cycle gas turbine hands over and takes over shift from the shift operator of gas turbines.
- 5.2. Operator of the gas turbine shall get familiarized with the administrative orders or shall be familiarized through the "Journal of administrative orders of the CCGT workshop".
- 5.3. Operational orders, as a rule, shall be received through or from the head of the shift of CCGT workshop.

5.4. Instructions of the laboratory assistants of the Chemical water treatment of the CCGT shall be performed through the operator-inspectors, making corresponding records in the operations bulletin of the CCGT.

5.5. In case of receiving the instructions directly from the director, chief engineer or from other administrative person of the power plant, fulfills it and notifies the head of the shift of CCGT and head of the CCGT workshop.

5.6. In operational telephone conversations with the personnel, first of all pronounces his surname and position, then shall transfer or receive order or message.

5.7. Disagreements which were not mutually solved, may be resolved by the "Commission on labor disputes".

6. Responsibility

6.1. Operator of gas turbine of the combined cycle gas turbine depending on the level and the character of the violation shall bear disciplinary, administrative and other measures of responsibility for failing to fulfill or improper fulfillment of his functional duties, obligations, which lead to occurrence of the accidents and emergencies, damage of the property of the employer and other unfavorable consequences in accordance with the currently in force legislation of the Republic of Uzbekistan.

Information data

Elaborated by the Combined Cycle Gas Turbine Workshop of the Open joint Stock Company NTPS

Head of the workshop	/signature/	I.H. Abdulloev
----------------------	-------------	----------------

Coordinated with

Production and technical division

Head of the division	/signature/	I.S. Murtazaev
----------------------	-------------	----------------

Planning and economic division

Head of the division	/signature/	F.R. Hojjeva
----------------------	-------------	--------------

Service for reliability of the equipment and industrial safety

Head of the division	/signature/	H. O. Muminov
----------------------	-------------	---------------

Legal Advisor	/signature/	T.A. Toylokov
---------------	-------------	---------------

Staff responsible for standardization	/signature/	O.L. Zelenskaya
---------------------------------------	-------------	-----------------

COMPANY STANDARD

JOB DESCRIPTION OF OPERATOR OF GAS TURBINE OF CCPP UNIT

INTRODUCTION

1 DEVELOPED BY CCPP UNIT OF OSJC “NTPP”

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF OSCJ
"NTPP"

dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

APPROVE

Chief Engineer of OJSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF OPERATOR OF GAS TURBINE OF CCGP UNIT

Validity period from up to

1 AREA OF USE

This instruction manual is based on the KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Unified tariff and qualification reference book of jobs and occupations of workers for the purposes of regulating the functions, duties, rights and responsibilities of the operator of gas turbine equipment of the Combined Cycle Combined Cycle Plant (CCGTs) and is mandatory for him.

It must be known by:

- auxiliary equipment operator;
- GT operator;
- Senior operator of the unit of the CCGT;
- Head of unit shift;
- Engineering and technical personnel of CCGT

2 General terms

2.1 For the post of gas turbine equipment operator are accepted, persons with a secondary specialized education who is not younger than 18 years old and who have undergone medical examination.

2.2 Prior to independent work, the gas turbine engine operator must undergo on-job training, according to a special training program. After passing the training, the operator of the gas turbine equipment is subjected to the examination of knowledge by the qualification commission under the chairmanship of the unit manager or his deputy for the operation of equipment, in the amount of necessary knowledge for the operator of gas turbine equipment, in accordance with the Rules for the organization of work with personnel at energy production enterprises registered by the Ministry of Justice of the Republic of Uzbekistan. 04 10 of 2002 No. 1178.

2.3 After passing the examinations, the operator of the gas turbine equipment must undergo duplication at the workplace of the gas turbine equipment

operator, for a period of not less than 12 shifts under the supervision of an experienced gas turbine operator. After the end of the period of duplication and with a positive evaluation of the emergency response, the operator of the gas turbine equipment, by order of the unit, is allowed to work independently.

2.4 The operator of the gas turbine equipment is appointed, moved and dismissed from his position by the order of the director of the enterprise upon presentation of the head of the unit of the CCGT, personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.5 The operator of the gas turbine equipment is technically and administratively responsible to the head of the unit of the CCGT, the deputy head of the equipment operation department and the leading engineer-technologist, and in the operative operator of the auxiliary equipment, the gas turbine operator of the CCGT unit, the senior operator of the CCGT and the shift supervisor of unit.

2.6 The operator of the gas turbine equipment is the person providing accident-free, reliable and economical operation of the HRSG and its auxiliary equipment.

2.7 The operator of the gas turbine equipment of the CCGT unit should know and be guided in its work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 as of 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011:
 - Section I Chapter I § 1-8 § 13-16;
 - Section II Chapter III § 6 - 9, § 11 paras. 487, 488.
- "Fire safety rules for energy enterprises", Tashkent 2004;
- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";
- "Instructions for first aid to victims in connection with accidents while servicing power equipment";
- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012, in the following volume:
 - Chapter I;
 - Chapter II;
 - Chapter III §§ 1-4, 5, 6, 9-11,

Chapter IV §§2 (B, D, D),
Appendices 1-8, 10, 15.

- Rules for the design and safe operation of pressure vessels approved by agreement with the Ministry of Justice of the Republic of Uzbekistan, referred to technical documents on December 23, 2011, No. 6-24 / 11-13112 / 6;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 1992:

Section 1 subsections 1.1, 1.2;

Section 4 subsection 4.5;

Section 5 subsections 5.1-5.4;

Section 6;

Section 8.

- The current job description.

2.8 In his work, a gas turbine equipment operator is guided by existing operational and production instructions and other directive materials, as well as orders and instructions from the management of the unit, senior operational personnel.

2.9 The operator of the gas turbine equipment of the CCGT unit should know:

- The device, operation and technical characteristics of the main and auxiliary equipment of the CCGT unit;

Production instructions for starting, stopping, operating the gas turbine and eliminating the emergency situation in the gas turbine operation of the CCGT as well as instructions of other units related to the equipment being serviced;

- Thermal diagrams of the serviced equipment of the CCGT unit;

- Purpose and principle of operation of instrumentation, signaling devices, technological protection, automation, interlocks, auto regulators;

- The territorial arrangement of the serviced equipment, pipelines, fittings and structures;

- Technical and economic indicators of the equipment of the CCGT unit and the planned targets for them.

2.10 Testing of knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;

- Periodic - on time;

- extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, higher authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoategeocontechnazorat" for workers of all categories once a year.

2.11 The service area of the operator of the gas turbine equipment of the CCGT unit is the technological equipment gas turbines with all auxiliary equipment of the CCGT unit, carbon dioxide fire extinguishing equipment, gas turbine and gas valves.

3 Functions and responsibilities

3.1 The operator of the gas turbine equipment is the person responsible for the correct, reliable, economical and trouble-free maintenance of the gas turbine and its auxiliary equipment, for timely and qualitative preparation of workplaces for performing repair work.

3.2 The operator of the gas turbine equipment works according to the approved schedule.

Violation of the schedule of duty is FORBIDDEN.

The change of shift of duty is allowed only with the permission of the unit manager or his deputies, and duty for two shifts in a row is PROHIBITED.

In the event that the changer does not go on duty, the gas turbine equipment operator is obliged to inform the shift supervisor about this, continue the duty until the operator of the gas turbine equipment is called in for duty.

3.3 When starting to work, the operator of gas turbine equipment must take a change from the previous operator of the gas turbine equipment of the CCGT unit, and after the end of the work, take the next shift according to the schedule.

Departure from duty without changing the shift is FORBIDDEN!

3.4. To get acquainted with the state of the scheme and the operating mode of the power plants in its operational control.

3.5 Obtain information from the person taking the shift about the equipment, for which it is necessary to conduct an especially careful observation. In the future, to prevent violations in work and equipment stored in the reserve and repair.

3.6 Find out what works are performed according to orders on the area assigned to it.

3.7 Check and accept tools, materials, key of premises, operational documentation.

3.8 Familiarize yourself with all the records and orders from the time since your previous watch.

3.9 Report directly to the operator on the shift to enter on duty and the deficiencies identified when taking the shift.

3.10 Changing the Shift is FORBIDDEN:

3.10.1 During the liquidation of the accident.

3.10.2 With contaminated equipment.

3.10.3 In the implementation of responsible switching operations.

3.10.4 When the duty personnel enter service in a disabled state.

3.11. Change of the shift during the liquidation of the accident, in case of violation of the equipment operation mode in exceptional cases, is allowed with the permission of the unit manager or his deputy for equipment operation, shift supervisor or Station shift head.

3.12 To issue a receipt-delivery shift of a record in the journal or a statement after the signature of the transferee.

3.13 The operator of gas turbine equipment is obliged to exercise constant control over the operating mode of the gas turbine and its auxiliary equipment. Take measures to reduce leaks of oils, cooling water.

3.14 During the patrol of the equipment, the operator of the gas turbine equipment of the CCGT unit conducts monitoring of the operation of the mechanisms, pipelines, the condition of supports and suspensions, the density of the oil systems, the insulation of the pipelines, the condition of the stairs, the areas, the condition of the safety valves, the presence of seals on emergency shutdown mechanisms, at the controls of the oil system valves, fire fighting equipment, lighting; vibration state of the bearings of the gas turbine; temperature of pump bearings and the state of turbine equipment; oil temperature on the drain from the bearings and behind the oil cooler; temperature of electric motors of pumps; condition of stuffing box seals.

Check the safety of tags on the valve; posters on RULES OF SAFETY TECHNIQUES and locking devices on equipment under repair; the absence of open (not enclosed) openings in floors, ceilings, maintenance areas.

All reported observations should be reported to the operator of gas turbines for recording defects in the log, and take measures to eliminate them.

3.15 Every 2 hours the gas turbine engine operator records the parameters (pressure, temperature, etc.) of the technical state of the gas turbine and its auxiliary equipment.

If the operation mode of the gas turbine and its auxiliary equipment is disrupted and the operation parameters and the Rules for the technical operation of the power plants and networks of the Republic of Uzbekistan do not match, the operator is informed about this and jointly they take measures to eliminate the violation of the regime.

3.16 Monitor the quality of the oil in the oil tank of the gas turbine, in the oil tank of the control system.

3.17 Observe the operation of the water part of the air cooler and fuel gas heater, avoiding temperature deviation from the relevant parameters of the heater and cooler. To do this, it monitors the flow and pressure in the heater, the pressure of air and feed water.

3.18 Maintain the cleanliness of workplaces, clean the spilled oil IMMEDIATELY.

3.19. Control the implementation of repair work on the gas turbine and auxiliary equipment.

3.20 By order, the gas turbine operator performs shift tasks.

3.21 Do not allow unauthorized persons to enter the working area without an escort.

3.22 Take measures to prevent freezing of equipment at negative outdoor temperatures.

3.23 In case of emergency.

3.23.1. An emergency situation means a violation of the normal operation of equipment or individual units, which, if not taken timely, creates a threat to the safety of the equipment, the uninterrupted operation of the station, and the safety of people.

3.23.2. Liquidation of the emergency situation on the unit is carried out under the supervision of the auxiliary equipment operator, the senior operator of the unit and the unit shift supervisor.

3.23.3 When the emergency situation is eliminated, the operator of the boiler shall:

- find out the nature and scale of the emergency damage;
- as soon as possible to identify the cause and take measures to eliminate the accident;
- report the incident to the auxiliary equipment operator; to the senior operator.

3.23.4 During the accident elimination, the gas turbine equipment operator shall take the necessary measures for the successful liquidation of the emergency situation, ensuring the safety of people and the safety of equipment, guided by the Rules of technical operation, job descriptions and production instructions, and in case of an unusual situation, makes decisions independently, depending on the specific situation.

3.23.5 On the measures taken to eliminate the emergency situation, reports to the operator the gas turbines and the senior operator.

3.23.6 If, at the time of the occurrence of the accident, any repairs or tests have to be stopped immediately, people are withdrawn.

In the emergency situation, all other personnel must be removed from the control room and accident areas, except for personnel who have unimpeded access to participate in the elimination of the accident.

3.23.7 If the emergency situation was created during the acceptance-delivery of the shift, all the personnel of the receiving shift are placed at the disposal of the head of the liquidation of the accident.

3.23.8 In case of accidents with people, the gas turbine engine operator is obligated to immediately provide assistance to the victim in accordance with the instructions for providing first aid, inform the shift supervisor of the call for a doctor.

3.24 The operator of the gas turbine equipment participates in the production of the necessary switching in the thermal circuits of the equipment under control, starting and stopping of the main and auxiliary equipment, testing and testing the equipment with the permission and under the supervision of the auxiliary equipment operator and the gas turbine of the CCGT unit. Participates in the preparation of a workplace for repair teams.

3.25 In the implementation of repair work, a gas turbine equipment operator shall:

3.25.1 Ensure the completeness of the fulfillment of the conditions for the production of work.

3.25.2 Perform periodic monitoring of working teams alongside and ordering.

3.25.3 Remove maintenance personnel from work when a violation of the RULES OF SAFETY TECHNIQUE is detected or the workplace is expanded by team members.

3.25.4 To accept workplaces for cleanliness after the termination of repair work.

3.25.5 Take part in the acceptance of equipment from the installation.

3.26 Complies with the operational orders of the higher-level operational staff of the CCGT unit.

3.27 Increases technical knowledge and skills by attending advanced training courses in the study of best practices, participation in training exercises.

3.28 Participates in events, shows and competitions held in the CCGT unit.

3.29 Timely on schedule, take the next exams according to the rules and in the amounts specified in paragraph 2.7.

3.30 It is forbidden to engage in strangers during working hours, not related to the performance of official duties, affairs.

4 Rights

4.1 Stop the equipment in the event of an accident or fire that threatens the safety of the equipment or the life of the personnel.

4.2 In case of receiving an order directly from the director, chief engineer or other administrative person of the station, it executes it and informs the operator of the auxiliary equipment of the CCGT unit.

4.3 Do not comply with orders that are contrary to the requirements of the Rules for the Technical Operation of Electric Power Stations and Networks, Safety Regulations, Fire Safety Rules or pose a threat to the safety of people or the safety of equipment.

4.4 In case of disagreement with the received order, it will appeal against it to the higher management, not suspending its execution, if this does not threaten damage to equipment and people's lives.

4.5 Remove unauthorized persons from the unit if they do not have an accompanying person.

5 Relationships

5.1 With administrative orders, the operator of gas turbine equipment should be acquainted or should be acquainted with the "Administrative order book of the unit CCGT CC".

5.2 In operational telephone conversations with personnel, first of all, he names his position and surname, and then receives an order (message) or himself makes a communication.

Having executed the received order, the operator of the gas-turbine equipment is obliged to report this to the person who issued the order.

5.3 The operator of the gas turbine equipment, during his duty, performs all administrative and technical orders of the unit manager of the CCGT and his deputy for the operation of equipment, the leading process engineer and operational orders of the auxiliary equipment operator, the senior operator of the unit, and the Shift head. Upon receipt of the instruction (team) it is obliged to repeat it, execute and report on its execution to the operator.

5.4 If the operator of the gas turbine equipment does not agree with the order received, he should notify the person who issued the orders, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

5.5 In case of receiving an order directly from the head of the unit, his assistant in charge of operation, the leading engineer-technologist brings to the attention of the GT operator and carries out this order.

5.6 Disagreements that have not found a common solution can be resolved by the "Labor Disputes Commission".

6 Responsibility

6.1 The operator of the gas turbine equipment shall be personally responsible for:

6.1.1 Untimely and substandard performance of the assigned functions, not the use of the granted rights;

6.1.2 Failure to comply with job description;

6.1.3. For their incorrect actions leading to an accident, damage to equipment, accidents, as well as for violation of the job description and production instruction, rules for Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, instructions and orders of the unit and power plant management, internal labor regulations, late delivery examinations.

6.1.4 Cases of fire resulting from its improper actions,

6.1.5 Preservation of serviced equipment and devices, including the safety of fire fighting equipment.

6.2 The operator of the gas turbine equipment of the CCGT unit, depending on the degree and nature of the violations, is involved in disciplinary, administrative and other measures of liability in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202-872: 2014

Informational data

Developed by CCGT Unit of OJSC "NTPP"

Head of unit

I.Kh.Abdulloev

Agreed

Production and Technical Department

Head of the department

T.H.Soliev

Planning and Economic Department

Head of the Department

E.E.Davov

Service reliability of machinery and industrial safety

Head of the service

Kh.O. Muminov

Senior Inspector for Labor Protection and Technology
security

T.K.Jumanazarov

Legal adviser

Sh.Y.Nazarov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF BOILER EQUIPMENT
OF CCPP UNIT**

Open Joint-Stock Company “NTPP”
Navoi

INTRODUCTION

1 DEVELOPED BY CCPP UNIT OF OJSC “NTPP”

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF OJSC
"NTPP"

dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

APPROVE

Chief Engineer of OJSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF PATROL-OPERATOR OF BOILER EQUIPMENT OF CCPP UNIT

Validity period from up to

1 AREA OF USE

This instruction manual is based on the KSt 202-810: 2011 "Regulations on the unit of combined cycle steam and gas turbine plants", the Unified tariff and qualification reference book of jobs and occupations of workers, in order to regulate the functions, duties, rights and responsibilities of the patrol-operator of the boiler equipment of the combined cycle steam and gas turbine plants (CCGT) and is mandatory for him.

It must be known by:

- The patrol-operator of the boiler equipment;
- auxiliary equipment operator;
- GT operator;
- Senior operator of the unit of the CCGT;
- Head of unit shift;
- Engineering and technical personnel of CCGT unit.

2 GENERAL TERMS

2.1 For the post of patrol-operator of the boiler equipment are accepted persons having a secondary special education, not younger than 18 years old, who have undergone medical examination.

2.2 Prior to the assignment to independent work, the patrol-operator of the boiler equipment must undergo industrial training according to a special training program. After passing the training, patrol-operator of the boiler equipment undergoes a knowledge check by the qualification commission, under the chairmanship of the unit manager or his deputy, in the amount of necessary knowledge for the patrol-operator of the boiler equipment, in accordance with the Rules for the organization of work with personnel at energy production enterprises registered by the Ministry of Justice of the Republic of Uzbekistan from 04.10.2002 of the year №1178.

2.3 After taking the exams, the patrol-operator of the boiler equipment must undergo duplication at the workplace of the patrol-operator of the boiler equipment, for a period of not less than 12 shifts under the supervision of an experienced patrol-operator of the boiler equipment. After the end of the period of duplication and with a positive assessment of the emergency response training, the operator of the boiler equipment, an order for the unit, is allowed to work independently.

2.4 The operator of the boiler equipment is appointed, moved and dismissed from the position by the order of the director of the enterprise upon presentation of the unit manager of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.5 The operator of the boiler equipment in production and technical and administrative respects is subordinate to the head of the CCGT unit, the deputy head of the equipment operation department and the leading process engineer, and in the operational - to the auxiliary equipment operator, the GT unit operator of the CCGT, the senior operator of the CCGT and the head of the shift unit of the CCGT.

2.6 The patrol-operator of the boiler equipment is the person providing accident-free, reliable and economical operation of the waste heat boiler and its auxiliary equipment.

2.7 The patrol-operator of the boiler equipment of the CCGT unit should know and be guided in its work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 of 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 of August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011:
 - Section I Chapter I § 1-8 § 13-16;
 - Section II Chapter III § 3; 6; 8 (paras. 408,409-418); § 9, 11 paras. 487, 488.
- "Fire safety rules for energy enterprises", Tashkent 2004;
- KSt 202-036: 2007 "Rules of internal labor regulations for employees of OJSC" NTES ";
- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012, in the following volume:

Chapter I;

Chapter II;

Chapter III §§ 1-4, 5, 6, 9-1;

Chapter IV §§2 (B, D, D),

Appendices 1-8, 10, 15.

- Rules for the design and safe operation of pressure vessels approved by agreement with the Ministry of Justice of the Republic of Uzbekistan, referred to technical documents on December 23, 2011, No. 6-24 / 11-13112 / 6;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 1992:

Section 1 subsections 1.1, 1.2;

Section 4 subsection 4.5;

Section 5 subsections 5.1-5.4;

Section 6;

Section 8.

- The current job description.

2.8 The patrol-operator of the boiler equipment of the CCGT unit should know:

- The device, operation and technical characteristics of the main and auxiliary equipment of the CCGT unit; production instructions for starting, stopping, operating boiler equipment and eliminating the emergency situation in the operation of boiler equipment CCGT, as well as instructions of other units related to the equipment being serviced;

- Thermal diagrams of the serviced equipment of the CCGT unit;

- Purpose and principle of operation of instrumentation, signaling devices, technological protection, automation, interlocks, auto regulators;

- The territorial arrangement of the serviced equipment, pipelines, fittings and structures;

- Technical and economic indicators of the equipment of the CCGT unit and the planned targets for them.

2.9 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;

- Periodic - on time;

- extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, higher authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoategeocontechnazorat" for workers of all categories once a year.

2.10 The service area of the patrol-operator of the boiler equipment of the CCGT unit is the technological equipment of the HRSG with all auxiliary equipment of the CCGT unit, gas equipment, burners of the HRSG within the main building.

3 Functions and responsibilities

3.1 The operator of the boiler equipment is the person responsible for the correct, reliable, economical and trouble-free maintenance of the boiler and its auxiliary equipment; for timely and qualitative preparation of workplaces for performance of repair work.

3.2 The patrol-operator of the boiler equipment works according to the approved schedule.

Violation of the schedule of duty is FORBIDDEN.

The change of the shift of duty is allowed only with the permission of the unit manager or his deputies, and duty for two shifts in a row is PROHIBITED.

In the event that the shiftman is not on duty, the patrol-operator of the boiler equipment must inform the Shift head about this, continue on duty until the operator arrives on the boiler equipment, called for on duty.

3.3 In its work, the operator of the boiler equipment is guided by existing operational and production instructions and other directive materials, as well as orders and instructions from the management of the unit, senior operational personnel.

3.4 Getting started, the operator of the boiler equipment should:

3.4.1. Take a shift from the previous patrol-operator of the boiler equipment of the CCGT unit, and after the end of the work, change the next one according to the schedule;

Departure from duty without changing the shift is FORBIDDEN!

3.4.2. Familiarize yourself with the state of the scheme and the operating mode of the power plants in its operational management;

3.4.3 Obtain information from the person taking the shift about the equipment, for which it is necessary to carry out a very careful monitoring;

In the future, to prevent violations in work and equipment that is in reserve and repair;

3.4.4 Find out what works are performed according to orders and orders in the area assigned to it;

3.4.5 Check and accept tools, materials, key of premises, operational documentation;

3.4.6. To get acquainted with all the records and orders during the past from their previous watch;

3.4.7 Report directly to the operator on the shift of attendance on duty and the shortcomings revealed when taking the shift.

3.5 Delivery of the shift is FORBIDDEN:

3.5.1 During the liquidation of the accident;

3.5.2 In case of contaminated equipment;

3.5.3 In the implementation of responsible switching operations.

3.6 When entering duty personnel in a disabled state, the change of the shift is FORBIDDEN.

3.7 Delivery of the shift during the liquidation of the accident, in case of violation of the equipment operation mode, in exceptional cases, is allowed with the permission of the unit manager or his deputies, the unit shift supervisor or the Station shift supervisor.

3.8 Make a receipt-delivery change of the shift in the journal or the statement after the signature of the transferee.

3.9 The patrol-operator of the boiler equipment is obliged to exercise constant control over the operating mode of the HRSG and its auxiliary equipment; take measures to reduce soaring, leakage of condensate, oils.

3.10 During the patrols of the equipment, the patrol-operator of the boiler equipment of the CCGT unit conducts control of the operation of mechanisms, pipelines, the condition of supports and suspensions, the density of oil systems of feed pumps, the insulation of pipelines, the condition of ladders, sites, the condition of safety valves, the presence of seals on the emergency release buttons, on loads of safety valves, on the controls of the oil system valves, fire-fighting equipment, lighting; vibration state of pump bearings; temperature of pump bearings and condition of boiler equipment; oil temperature on the drain from the bearings and behind the oil cooler; temperature of electric motors of pumps; condition of stuffing box seals; safety of tags on the valve; posters on RULES OF SAFETY TECHNIQUES and locking devices on equipment under repair; the absence of open (not enclosed) openings in floors, ceilings, maintenance areas.

3.11 Report all the observations revealed to the operator of the auxiliary equipment for writing to the defects log, and take measures to eliminate them.

3.12 Every 2 hours, the operator of the boiler equipment records the parameters (pressure, temperature, etc.) of the technical condition of the HRSG.

3.13 If the operation mode of the HRSG, the violation of the chemical regime of the boiler equipment and the mismatch of the operating parameters and the Rules for the technical operation of the power plants and networks of the Republic of Uzbekistan, inform the operator and measures are jointly taken to eliminate the violation of the regime.

3.14 It monitors the quality of oil in the oil tanks of feed pumps.

3.15. It monitors the operation of the water part of the air cooler and the fuel gas heater, preventing temperature deviation from the relevant parameters of the heater and cooler.

To do this, it monitors the flow and pressure in the heater, the pressure of the feed water.

3.16 Maintains clean jobs, spilled oil removes immediately

3.17 Monitor the production of repair work on the boiler and auxiliary equipment.

3.18 On the instructions of the auxiliary equipment operator, performs shift tasks.

3.19 Does not allow unauthorized persons to enter the area of the operating equipment without an escort.

3.20 Take measures to prevent freezing of equipment at negative outdoor temperatures.

3.21 The operator of the boiler equipment participates in the manufacture of the necessary switching in the thermal circuits of the equipment under control, the start-up and shutdown of the main and auxiliary equipment, crimping, testing the equipment with the permission and under the supervision of the auxiliary equipment operator and the unit's unit. Participates in the preparation of a workplace for repair teams.

3.22 In case of emergency:

3.22.1. An emergency situation means a violation of the normal operation of equipment or individual units, which, if not taken timely, creates a threat to the safety of the equipment, the uninterrupted operation of the station, and the safety of people.

3.22.2 The emergency situation on the unit is eliminated under the supervision of the auxiliary equipment operator, the senior operator of the unit and the shift supervisor.

3.22.3 In the event of liquidation of an emergency situation, the patrol-operator of the boiler equipment shall:

- find out the nature and scale of the emergency damage;
- as soon as possible to identify the cause and take measures to eliminate the accident;
- report the incident to the auxiliary equipment operator; to the senior operator.

3.22.4 During the elimination of the accident, the patrol-operator of the boiler equipment takes the necessary measures to successfully eliminate the emergency situation, ensuring the safety of people and the safety of equipment, guided by Rules of technical operation, official and production instructions, and in case of an unusual situation, makes decisions independently, depending on the specific situation.

3.22.5 On the measures taken to eliminate the emergency situation, reports to the auxiliary equipment operator and the senior operator.

3.22.6 If, at the time of the occurrence of the accident, any repairs or tests have been carried out, they must be IMMEDIATELY DISCONTINUED, people are withdrawn.

In an emergency situation, all other personnel should be removed from the control room and accident areas, except for personnel who have unimpeded access to participate in the elimination of the accident.

3.22.7 If the emergency situation was created during the acceptance-delivery of the shift, all the personnel of the receiving shift are placed at the disposal of the head of the liquidation of the accident.

3.22.8 In case of accidents, the patrol-operator of the boiler equipment must immediately provide assistance to the victim in accordance with the instructions for first aid, inform the shift supervisor of the call for a doctor.

3.23 In the production of repair work, the patrol-operator of the boiler equipment shall:

3.23.1 Ensure the fulfillment of the conditions for the production of work.

3.23.2 Perform periodic monitoring of working teams alongside and ordering.

3.23.3 Remove the repair personnel from work when a violation of the RULES OF SAFETY TECHNIQUE is detected or the workplace is expanded by the team members.

3.23.4 To accept workplaces for cleanliness after the termination of repair work.

3.23.5 Take part in the acceptance of equipment from the installation.

3.24 Complies with the operational orders of the higher-level operational staff of the CCGT unit.

3.25 Increases technical knowledge and skills by attending advanced training courses in the study of best practices, participation in training exercises.

3.26 Participates in events, shows and competitions held in the CCGT unit.

3.27 Timely on schedule, take the next exams in accordance with the rules and in the amounts specified in paragraph 2.7.

3.28 It is forbidden to engage in strangers during working hours, not related to the performance of official duties, affairs.

4 Rights

4.1 Stop the equipment in the event of an accident or fire that threatens the safety of the equipment or the life of the personnel.

4.2 In case of receiving an order directly from the director, chief engineer or other administrative person of the station, it executes it and informs the operator of the auxiliary equipment of the CCGT unit.

4.3 Do not comply with orders that are contrary to the requirements of the Rules for the Technical Operation of Electric Power Stations and Networks, Safety Regulations, Fire Safety Rules or pose a threat to the safety of people or the safety of equipment.

4.4 In case of disagreement with the received order, it has the right to appeal against it to the higher management, without suspending its execution, if this does not threaten damage to equipment and people's lives.

4.5 Remove unauthorized persons from the unit if they do not have an accompanying person.

5 Relationships

5.1 With instructions of the administrative order, the patrol-operator of the boiler equipment must be acquainted or should be acquainted with the "Journal of administrative orders of the unit of the CCGT".

5.2 In operational telephone conversations with personnel, first of all, he names his position and surname, and then receives an order (message) or he himself makes a message.

Having executed the received order, the patrol-operator of the boiler equipment is obliged to report this to the person who gave the order.

5.3 The patrol-operator of the boiler equipment during his duty performs all the administrative and technical orders of the unit manager of the CCGT and his deputy for operation, the leading process engineer and the operational orders of the auxiliary equipment operator, the senior operator of the unit, the Shift head.

Upon receipt of the instruction (team) it is obliged to repeat it, execute and report on its execution to the operator.

5.4 In case of disagreement with the received instruction, the patrol-operator of the boiler equipment must notify the person who issued the orders, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

5.5 In the event that an order is received directly from the unit manager, his operation assistant, the lead process engineer informs the operator of the auxiliary equipment and executes this order.

5.6 Disagreements that have not found a common solution can be resolved by the "Labor Disputes Commission".

6 Responsibility

6.1 The patrol-operator of the boiler equipment shall be personally responsible for:

6.1.1 Untimely and substandard performance of the assigned functions, not the use of the granted rights;

6.1.2 Failure to comply with job description;

6.1.3. For their incorrect actions leading to an accident, damage to equipment, accidents, as well as for violation of the job description and production instruction, rules for Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY instructions and instructions of the unit and power plant management, internal labor regulations, late exams .

6.1.4 Cases of fire resulting from its improper actions,

6.1.5 Preservation of serviced equipment and devices, including the safety of fire fighting equipment.

6.2 The patrol-operator of the boiler equipment of the CCGT unit, depending on the degree and nature of the violations, is brought to disciplinary,

administrative and other measures of responsibility in accordance with the current legislation of the Republic of Uzbekistan.

Informational data

Developed by CCGT unit of OJSC “NTPP”

Head of unit

I.Kh.Abdulloev

Agreed

Production and Technical Department

Head of the department

T.H.Soliev

Planning and Economic Department

Head of the Department

E.E.Davov

Service reliability of machinery and industrial safety

Head of the service

Kh.O. Muminov

Senior Inspector for Labor Protection and Technology

security

T.K. Dzhumanazarov

Legal adviser

Sh.Y.Nazarov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE OPERATOR OF AUXILLARY
EQUIPMENT (BOP OPERATOR) OF CCPP UNIT**

STOCK COMPANY SC « NTPP »
NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC " NTPP "
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INSTEAD OF KSt 202-831:2012

Approved

Chief engineer SC « NTPP »

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF THE OPERATOR OF AUXILLARY EQUIPMENT (BOP OPERATOR) OF CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Unified tariff and qualification reference book of jobs and occupations of workers in order to regulate the functions, duties, rights and responsibilities of the operator for the auxiliary equipment of the combined cycle gas turbine plants (CCGTs) and is mandatory for him. Manual should be known by: the shift supervisor of the CCGT, the head of the CCGT and his deputies, the engineers of the CCGT, the head of the shift station.

2 General terms

2.1 The operator of the CCGT auxiliary equipment is a person providing reliable, safe and economical operation of a combined cycle plant with a capacity of 478

MW with all its auxiliary equipment in accordance with Rules of technical operation, instructions and dispatch schedule of loads.

2.2 For the position of an operator for auxiliary equipment of steam and gas turbine installations of a combined cycle are accepted, persons who are not younger than 18 years of age, have secondary specialized education, have undergone medical examination, are specially trained, systematically instructed, passed the examination of the qualification commission, have an identity certificate, trainee and duplication in accordance with the Rules of the organization of work with personnel at enterprises of power production, registered by MINof Just. of RUz from 04.10.2002 year № 1178.

2.3 The operator of the auxiliary equipment of combined cycle gas turbine plants is appointed, moved and dismissed from the position by the director of the enterprise upon presentation of the unit manager of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The operator of the auxiliary equipment of combined cycle gas turbine plants in production, technical and administrative terms is subordinate to the head of the CCGT unit, the deputy head of the maintenance department and the lead engineer of the TME, in operational terms to the head of the shift station, the shift head and the senior patrol operator of the CCGT unit.

The operator of the auxiliary equipment of combined cycle gas turbine plants is promptly subordinated to gas turbine equipment operators and patrol-operators of turbine and boiler equipment.

2.5 Operator for auxiliary equipment should know and be guided in his work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", Tashkent 2011;
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan », Tashkent 2011.

Section I Chapter 1;

Section II Chapter 1;

Chapter 2. § 4;

Chapter 3. § 1, 3, 4, 5, 7, 8, 9, 12, 13;

Chapter 5.

- "Safety rules for the operation of thermal mechanical equipment of a power plant of heating networks" in the following volume:

Section 1;

Section 2;

Section 3; subsection 3.1D, E;

subsection 3.2B, G, D;

subsection 3.3 A;

subsection 3.6;

subsection 3.7;

subsection 3.8;

Section 4

Appendices 1-12.

- "Safety rules in the gas economy of the Republic Uzbekistan ", Tashkent - 2004, in the following volume:

Chapter I;

Chapter I I § 2;

Chapter I I I § 1, 2, 3, 4, 7, 8;

Chapter IV;

Applications 1, 31.

- "Rules of the device and safe operation of steam and hot water pipelines", 2010;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Boilers", Tashkent 1997;

- "Fire safety rules for energy enterprises ", Tashkent 2013;

- "Explosion safety rules when using fuel oil and natural gas in boiler plants".
- The present job description and instructions for patrol-operators of boiler and turbine equipment.
- KSt 202-036: 2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";
- "Instructions for first aid to victims in connection with accidents in the service of power equipment"
- "Instructions for investigating and recording technological irregularities in the operation of power plants, networks and power systems".
- "Instructions for the conservation of high-pressure drum boilers in the mode of their shutdown".
- "Safety rules when working with tools and devices";
- Section 3;
- Section 4;
- Section 5.
- KSt 202-032: 2008 "Rules for working with low-sulfur gas."
- RH 34-400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry".
- Typical instructions for the operation of BROU, ROU.

2.6 The operator of auxiliary equipment of CCGT should know:

- 2.6.1. The device, the principle of operation and technical characteristics of the HRSG, gas and steam turbines, generators, transformers, gas boosting compressor plant, cooling tower and auxiliary equipment.
- 2.6.2 Thermal protection and their action.
- 2.6.3 Thermal schemes and technological process for the production of thermal and electric power.
- 2.6.4 Load modes of CCGTs.
- 2.6.5 Principal electrical diagram of generators and auxiliary needs of CCGT Unit.
- 2.6.6 Purpose and principle of operation of the control-measuring devices, signaling devices, automation, interlocks and regulators.
- 2.6.7. The quality standards for steam, water, fuel, oils.
- 2.6.8 Location of all equipment pipelines, fittings and structures.

2.6.9 Technical and economic indicators of the CCGT and planned targets for them.

2.6.10 Fundamentals of heat engineering, electrical engineering, mechanics and water treatment.

2.7 The verification of the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- an extraordinary one - in case of violation of the rules and instructions, at the request of the state supervision bodies, the State Inspectorate for the operation of power plants and networks and higher authorities, the resolution of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

The periodicity of checking the knowledge of RULES OF SAFETY TECHNIQUE, the rules of the device and the safe operation of equipment controlled by the SI "Sanoatkontekhnazorat" is as follows: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.8 Operator's auxiliary equipment workstation the CCGT is located in the control building of the CCGT-478MW.

2.9 The operator's service area for the auxiliary equipment of the CCGT is the thermal mechanical equipment included in the system of the CCGT unit of the CCGT (HRSG, dosing unit with chemical reagents of the steam-water cycle, the circulating cooling tower with pumps and with the dosing unit, oily waste water treatment plants, boiler room with CCGT pumps) .

3 Functions and responsibilities

3.1 Operational maintenance of the CCGT unit and ensuring its uninterrupted and economical operation.

3.2 Upon acceptance of the shift, the operator of auxiliary equipment of CCGT must:

- get acquainted with the status, the scheme and the operating mode of the power plants that are in its operational control, in the volume defined by appropriate instructions;
- to receive information from the shifting about the equipment, for which it is necessary to conduct especially careful monitoring, for prevention of violations in work, and equipment located in reserve in repair;
 - to find out what works are performed according to the orders and orders in the area assigned to it;
- check and accept fire hoses, protective equipment, which are stored in the control room, operational documentation and workplace documentation;
- read all the records and orders for the time, past from his previous watch;
 - accept the report from the subordinate staff of the CCGT on entering duty and on the shortcomings revealed when taking the shift for the shift supervisor;
 - formalize the acceptance and delivery of the shift with a record in the statement for its signature and the signature of the transferor.

Departure from duty without changing the shift is FORBIDDEN.

3.3 Starting and stopping, testing, crimping equipment.

3.4 Switching in thermal and electrical circuits of the CCGT unit.

3.5. Shutdown of gas and steam turbine generator and switching of auxiliary power supply from main to standby and vice versa (in emergency situations).

3.6 Monitoring of the reading of measuring instruments, work autoregulators and alarms.

3.7 Troubleshooting and Acceptance of Equipment measures to eliminate them.

3.8 The operator of the auxiliary equipment of the CCGT, in the event of emergency situations and the elimination of an accident, must:

- to draw up a general idea of what happened according to the signaling devices and external signs;
 - eliminate the danger to personnel and equipment, up to the disconnection of the latter, if this becomes necessary;
- do not interfere with the operation of automatic devices;
- ensure the normal operation of the main equipment remaining in the work, as well as the mechanisms of its own needs CCGT;

- find out the place, nature and extent of damage and disconnect damaged equipment;
- equipment disconnected during the accident should be put into operation immediately after finding out and eliminating its malfunctions, by order of the shift manager of the CCGT unit;
- for each operation for the elimination of accidents, the auxiliary equipment operator must report to the shift supervisor or the senior operator without waiting for a survey.

3.9 Management of subordinate workers (patrol-operators).

3.10 Preparation of the workplace for repair.

3.11 Increase of technical knowledge, participation in technical training.

3.12 Keep his workplace clean.

3.13 Provision of first aid to the victim.

3.14 The operator-free operator's watch can be used as a machine operator by the order of the unit after duplication and briefing.

4 Rights

4.1 Give operational orders to a subordinate personnel and demand their execution.

4.2 Stop the equipment in the event of an accident or fire, threatening the safety of equipment or life of staff.

4.3 Represent the management of the unit through the head of the CCGT shift of the offer for the promotion of subordinate personnel or for imposing penalties on him.

4.4. Suspend work and remove from its workplace all persons who impede the normal operation of the equipment.

4.5 Do not follow orders that are contrary to the requirements of Rules of technical operation, RULES OF SAFETY TECHNIQUE or pose a threat to the safety of people or the safety of equipment.

4.6 Appeal in case of disagreement other orders, without suspending their execution.

5 Relationships

5.1 The operator of the auxiliary equipment of the CCGT delivers and receives a shift from the replacement operator for auxiliary equipment.

5.2. With the administrative order, the operator of the auxiliary equipment of the CCGT should familiarize himself or be acquainted with the "Journal of Administrative Orders of the CCGT Unit".

5.3 Operational orders should, as a rule, to enter through or from the shift supervisor and the senior operator of the power unit of the CCGT.

5.4. Instructions of laboratory assistants of the Chemical water treatment of CCGT performs by means of patrol-operators, making corresponding entries in the operative list of the CCGT.

5.5 In case of receiving an order directly from the director, chief engineer or from another administrative person of the station, he executes it and informs the shift supervisor of the CCGT and the unit manager of the CCGT.

5.6 In the course of operational telephone conversations with personnel, first of all he names his office, and then transmits or receives an order or a message.

5.7 Disagreements that have not found a common solution may be resolved by the "Labor Disputes Commission".

6 Responsibility

6.1 The operator of auxiliary equipment of combined cycle gas turbine plants, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing their functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences , in accordance with the current legislation of the Republic of Uzbekistan an.

Informational data

Designed by the CCGT unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

E. E. Davov

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

The Legal Advisor

Sh. Nazarov

Responsible for Standardization

N.S. Nurullaeva

STANDARD OF THE ENTERPRISE

JOB INSTRUCTION
OF THE OPERATOR OF STEAM TURBINE OF THE WORKSHOP
OF THE COMBINED CYCLE GAS TURBINES

Open Joint Stock Company NTPS
Navoi

Foreword

1. ELABORATED AND SUBMITTED by the Workshop of the Combined Cycle Gas Turbines of the Open Joint Stock Company NTPS
2. APPROVED AND ENFORCED by the Order of the Open JSC NTPS date _____ No. _____
3. INTRODUCED FOR THE FIRST TIME

Approved
Chief Engineer of Open JSC NTPS

/signature/ T.G. Nazarov

STANDARD OF THE ENTERPRISE

JOB INSTRUCTION
OF THE OPERATOR OF STEAM TURBINE OF THE WORKSHOP
OF THE COMBINED CYCLE GAS TURBINES

Validity period from 01.07.2012 to 01.07.2015

1. Field of application

The present Instruction is elaborated on the basis of the KSt 202-810:2011 “Regulations on the workshop of the combined cycle gas turbines”, Unified tariff-qualification reference book of the works and professions of the workers, for the purposes of regulation of the functions, obligations, rights and responsibilities of the operator of steam turbine of the workshop of combined cycle gas turbines (CCGT) and is obligatory for him.

2. General Provisions

2.1. Persons not younger than 18 years, with general secondary education, who have passed medical examination, specially trained, systematically briefed, passed examination of the qualification commission, who have certificates and passed training and duplication in accordance with the Rules of organization of the work with the personnel at the enterprises of the energy generation, registered by the Ministry of Justice of the Republic of Uzbekistan dated 04.10.2002 No. 1178 are accepted to the position of the operator of steam turbines of the combined cycle gas turbine.

2.2. Operator of steam turbines of the CCGT is assigned to his position, transferred to other position and dismissed from the position by the order of the Director of the enterprise upon proposal of the Head of the CCGT workshop, Human Resource Department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3. Operator of steam turbines of the CCGT from the production-technical and administrative point of view is subordinated to the Head of the CCGT workshop and deputy head of the workshop on operation of equipment, while in the operational aspects he is subordinated to head of the shift of the CCGT workshop.

Operator of steam turbines of the CCGT has under his operative subordination operators-inspectors on gas turbine and boiler equipment.

2.4. Operator of steam turbines of the CCGT shall be aware and follow in performing his duties the followings:

- Instruction RR-56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated 12.01.1999 No. 140 "On the measures aimed on strengthening the operational discipline"
- Law of the Republic of Uzbekistan "On Electric power" No. 225 dated 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated 22.08.2009 "On Approval of the rules of using the electric and heat power";
- "Rules of the Installation and safe operation of the vessels operating under pressure": Tashkent 1997;
- "Rules of design and safe operation of the pipelines of steam and hot water" 1992;
- "Rules of design and safe operation of the steam and water heating boilers", Tashkent 1997;
- "Rules on fire safety for the power enterprises", Tashkent 2004;
- "Rules of explosion safety in using the mazut and natural gas in the boiler units".
- the present Job Instruction;
- KSt 202-032:2008 "Rules of operation with the low sulfur gas".

"Rules of technical operation of the power plants and networks of the Republic of Uzbekistan", Tashkent 2005, in the following scope:

- | | | |
|------------|------------|-------------------------------|
| Section I | Chapter 1; | |
| Section II | Chapter 1; | |
| | Chapter 2. | §4; |
| | Chapter 3. | §1, 3, 4, 5, 7, 8, 9, 12, 13; |
| | Chapter 5. | |

- "Rules of Safety measures in operation of the heat mechanics equipment of the power stations and heating networks" 1985, in the following scope:

- | | |
|------------|---------------------------|
| Section 1; | |
| Section 2; | |
| Section 3 | Subsection 3.1 E, F; |
| | Subsection 3.2 C, D, E; |
| | Subsection 3.3 A; |
| | Subsection 3.6, 3.7, 3.8; |

Section 4;

Annexes 1-12;

- Rules of safety in the gas sector of the Republic of Uzbekistan, Tashkent – 2004, in the following scope:

- | |
|--------------------------------|
| Chapter I; |
| Chapter II §2; |
| Chapter III §1, 2, 3, 4, 7, 8; |
| Chapter IV; |
| - Annexes 1, 31. |

- KSt 202-036-2007 "Rules of internal labor policy of the workers of the Open Joint Stock Company "NTPS"";

- "Rules of safety in working with the instruments and devices";

Chapter 3, 4, 5

- "Instructions on rendering first aid to the injured persons in connection with the accidents in the process of servicing the energy equipment";

- "Instructions on investigation and accounting of the technological violations in the operation of the power stations, networks and power grids"

- "Instructions on conservation of the drum boilers of high pressure in the regimen of their shutdown".

- RH 34-400:2008 "Regulations on the system of management of the labor safety in the power sector".

- Model instructions on operation of fast-response pressure-reducing and desuperheating station, pressure-reducing and desuperheating station.

2.6. Operator of steam turbines of the CCGT shall know followings:

2.6.1. Design and principle of operation and technical specifications of the boiler utilizer, gas and steam turbines, generators, transformers, gas boosting compressor station, cooling tower and balance of plant.

2.6.2. Heat protections and their operation.

2.6.3. Heat circuits and technological process of production of heat and electric power.

2.6.4. Regimen of loads of the power unit of CCGT.

2.6.5. Principal electric circuit of the generators and own needs of the block of CCGT.

2.6.6. Designation and principle of operation of the controlling and measurement devices, alarms, automatics, block ups and regulators.

2.6.7. Norms of quality of the steam, water, fuel and lubricants.

2.6.8. Territorial layout of all equipment, pipelines, valves and facilities.

2.6.9. Technical and economic indicators of the CCGT and planned assignments on them.

2.6.10. Basics of the heat engineering, electric engineering, mechanics and water treatment.

2.7. Examination on the knowledge of the technical operation rules, safety rules, fire safety, job instructions and industrial instructions shall be carried out as follows:

- initial – before granting the permission to the independent operation;

- periodical – within the set periods;

- unscheduled – in case of violation of the rules and instructions, upon the request of the bodies of the State Control, State Energy Inspection, higher bodies of management in accordance with the decision of the special commission.

Periodical examination for the knowledge of the Operation Rules, Fire Safety Rules, industrial and job instructions shall be carried out not later than once in 3 years.

Periodicity of the examination of the knowledge of the safety rules, rules of installation and safe operation of the equipment, supervised by the State Inspection "Sanoatgeokontehnazorat" is as follows: for

the persons, directly connected with the operation and servicing the power units, as well as for the workers of all categories once a year.

2.8. Working place of the operator of steam turbine of CCGT is located in the building of the electric department of the CCGT-478 MW

2.9. Servicing zone of the operator of steam turbine of the CCGT is servicing of steam turbine of the 478 MW combined cycle gas turbine (one person in one shift) with all auxiliary equipment (condenser, vacuum pumps, closed cooling system, steam conduits and pipelines within the area of the steam turbine).

3. Functions and duties

3.1. Main functions and obligations of the operator of steam turbine of CCGT are operational servicing of the power unit of the CCGT and ensuring its continuous and economic operation.

3.2. At the time of taking over of the shift operator of the steam turbine of CCGT is obliged:

- to get familiarized with the status, circuit and regimen of the operation of the power units, under his operative management, within the scope determined by the corresponding instructions;
- to receive information from the person who is handing over the shift about the equipment, which shall be especially thoroughly observed, for the purposes of preventing the disturbances in the operation, and about the equipment, which is in the reserve and in repair;
- to clarify what kind of works is in process in accordance with the orders and instructions at the areas assigned to him;
- to examine and accept the fire hose, protection means, which are stored at Unit switchboard, operative documentation and documentation of the working place;
- to get familiarized with all records and instructions for the period, passed from the previous period of duty;
- to receive report from the subordinated personnel;
- to report to the head of the shift of the CCGT on taking over the duty and on shortcomings, which were revealed at the time of takeover the shift.
- to register the takeover-handover of the shift by the records to the bulletin with his signature and the signature of the person handing over the shift.

Leaving the shift without handover of the shift is PROHIBITED.

3.3. Start up and shut down, testing, pressure testing of the equipment.

3.4. Switching in the heat and electric circuits of the power unit of CCGT.

3.5. Shutdown of the gas and steam turbine generator and switching the supply of the own needs from the main to reserve and vice versa (in emergency situations).

3.6. Control of the indicators of the measurement devises, operation of the auto regulators and alarm system.

3.7. Revealing defects in the operation of the equipment and undertaking measures aimed on their elimination.

3.8. Operator of the steam turbine of the CCGT in case of the emergency situations and liquidation of the emergencies is obliged:

- to compile general picture of what happened in accordance with the indicators of the alarm devises and external signs;

- to eliminate the hazard for the personnel and equipment, up to disconnecting it, is necessity will arise;
 - do not interfere to the operation of the automatic devises;
 - to ensure normal operation of the main equipment which is in operation; as well as mechanisms of own needs of the CCGT;
 - to identify the place, character and volume of the damages and to shut down damaged equipment;
 - switched down in the process of emergency equipment shall be started up immediately after clarifying and elimination of its malfunctions, upon the order of the head of the shift of the CCGT workshop;
 - on each operation on liquidation of the emergency the operator steam turbine is obliged to report to the head of the shift without waiting for the inquiry.
- 3.9. Management of the subordinated workers (operator-inspectors).
 - 3.10. Preparing the working place for repair;
 - 3.11. Raising technical knowledge, participation in the training.
 - 3.12. Maintaining cleanness of his working place.
 - 3.13. Rendering first aid to the injured person.
 - 3.14. Free from the duty operator of steam turbine may be used by the instructions on the workshop as operator-inspector after duplication and briefing.

4. Rights

- 4.1 To give operational orders to the subordinated personnel and check their implementation;
- 4.2. To stop equipment in case of emergency or fire, threatening the safety of the equipment or life of the personnel.
- 4.3. Submit to the management of the workshop through the head of the shift of CCGT proposals on stimulation of the subordinated personnel or on imposing penalty to the personnel.
- 4.4. Suspend the works and remove all persons from the working place, who hinder normal operation of the equipment.
- 4.5. Do not fulfill the orders, which contradict to the requirements of the rules of technical operation of power plants and networks, rules of safety measures, fire safety rules or threaten the safety of the people or equipment.

5. Interactions

- 5.1. Operator steam turbine of CCGT hands over and takes over shift from the shift operator of steam turbines, who is handing over the shift.
- 5.2. Operator of the steam turbine shall get familiarized with the administrative orders or shall be familiarized through the "Journal of administrative orders of the CCGT workshop".
- 5.3. Operational orders, as a rule, shall be received through or from the head of the shift of CCGT workshop.
- 5.4. Instructions of the laboratory assistants of the Chemical water treatment of the CCGT shall be performed through the operator-inspectors, making corresponding records in the operations bulletin of the CCGT.

5.5. In case of receiving the instructions directly from the director, chief engineer or from other administrative person of the power plant, fulfills it and notifies the head of the shift of CCGT and head of the CCGT workshop.

5.6. In operational telephone conversations with the personnel, first of all pronounces his surname and position, then shall receive instruction (message) or himself shall transfer the message.

5.7. Disagreements which were not mutually solved, may be resolved by the "Commission on labor disputes".

6. Responsibility

6.1. Operator of steam turbine of the combined cycle gas turbine depending on the level and the character of the violation shall bear disciplinary, administrative and other measures of responsibility for failing to fulfill or improper fulfillment of his functional duties, obligations, which lead to occurrence of the accidents and emergencies, damage of the property of the employer and other unfavorable consequences in accordance with the currently in force legislation of the Republic of Uzbekistan.

Information data

Elaborated by the Combined Cycle Gas Turbine Workshop of the Open joint Stock Company NTPS

Head of the workshop	/signature/	I.H. Abdulloev
----------------------	-------------	----------------

Coordinated with

Production and technical division

Head of the division	/signature/	I.S. Murtazaev
----------------------	-------------	----------------

Planning and economic division

Head of the division	/signature/	F.R. Hojjeva
----------------------	-------------	--------------

Service for reliability of the equipment and industrial safety

Head of the division	/signature/	H. O. Muminov
----------------------	-------------	---------------

Legal Advisor	/signature/	T.A. Toylokov
---------------	-------------	---------------

Staff responsible for standardization	/signature/	O.L. Zelenskaya
---------------------------------------	-------------	-----------------

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF THE TURBINE
EQUIPMENT OF CCPP UNIT**

Open Joint-Stock Company “NTPP”
Navoi

INTRODUCTION

1 DEVELOPED BY CCPP UNIT OF OJSC “NTPP”

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF OJSC
"NTPP"

dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

2.3 Prior to the appointment to work independently, the patrol-operator of turbine equipment should undergo industrial training in accordance with a special training program. After completing the training, the patrol-operator of turbine equipment is subjected to a knowledge check by the qualification commission, under the chairmanship of the unit manager or his deputy for operating the equipment in the amount of necessary knowledge for the patrol-

operator of turbine equipment, in accordance with the Rules of the organization of work with personnel at energy production enterprises registered by the Ministry of Justice of the Republic of Uzbekistan. 04 10 2002 year no. 1178.

2.4 After passing the examinations, the patrol-operator of turbine equipment must undergo a duplication at the workplace of the patrol-operator of turbine equipment for a period of not less than 12 shifts, under the supervision of an experienced patrol-operator of turbine equipment. After the end of the period of duplication and with a positive assessment of the emergency response, the patrol-operator of turbine equipment is allowed to work independently by order of the unit.

2.5 The patrol-operator of turbine equipment is appointed, moved and dismissed from the position by the order of the director of the enterprise upon presentation of the head of the unit of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.6 The operator of the turbine equipment is technically and administratively responsible to the head of the unit of the CCGT, to the deputy head of the equipment operation department, and to the leading engineer-technologist, and in the operative - to the auxiliary equipment operator, to the steam-turbine operator of the CCGT unit, to the senior operator of the CCGT and the head of the shift of CCGT unit.

2.7 The patrol-operator of turbine equipment of the CCGT unit should know and be guided in its work:

- Indication of PP-56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline ";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 as of 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005:
 - Section I Chapter I § 1-8 § 13-16;
 - Section II Chapter III § 4, 5, 7, paras. 404-418; §9; §eleven paras. 487, 488.
- "Fire safety rules for energy enterprises", Tashkent 2004;
- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";

- "Instructions for first aid to victims in connection with accidents while servicing power equipment";
- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012, in the following volume:
 - Chapter I;
 - Chapter II;
 - Chapter III §§ 1-4, 5, 6, 9-11,
 - Chapter IV §§ 2 (B, D, D),
 - Appendices 1-8, 10, 15.
- Rules for the design and safe operation of pressure vessels approved by agreement with the Ministry of Justice of the Republic of Uzbekistan, referred to technical documents on December 23, 2011, No. 6-24 / 11-13112 / 6;
- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 1992:
 - Section 1 subsections 1.1, 1.2;
 - Section 4 subsection 4.5;
 - Section 5 subsections 5.1-5.4;
 - Section 6;
 - Section 8.
- A real job description.

2.8 In its work, the patrol-operator of turbine equipment is guided by existing operational and production instructions and other directive materials, as well as orders and instructions from the management of the unit, senior operational personnel.

2.9 The patrol-operator of turbine equipment at the CCGT unit should know:

- The device, operation and technical characteristics of the main and auxiliary equipment of the CCGT unit;
- Production instructions for start-up, shutdown, operation of steam-turbine equipment and liquidation of the emergency situation in the operation of the CCGT steam turbine, as well as instructions of other units related to the equipment being serviced;
- Thermal diagrams of the serviced equipment of the CCGT unit;
- Purpose and principle of operation of instrumentation, signaling devices, technological protection, automation, interlocks, auto regulators;
- The territorial arrangement of the serviced equipment, pipelines, fittings and structures;
- Technical and economic indicators of the equipment of the CCGT unit and the planned targets for them.

2.10 Testing of knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;

- extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, higher authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules of the device and safe operation of equipment, controlled SI "Sanoatgeocontechnazorat" for workers of all categories once a year.

2.11 The service area of the patrol-operator of turbine equipment of the CCGT unit is the technological equipment of the steam turbine with all auxiliary equipment, the condenser, the condensate system, the closed cooling circuit system, the auxiliary cooling system, the circulating water system condenser and cooling tower; vacuum pumps; the first, second, third floors of the steam turbine building; district heating system.

3 Functions and responsibilities

3.1 The patrol-operator of turbine equipment is the person responsible for the correct, reliable, economical and accident-free operation of the steam turbine and its auxiliary equipment, for the timely and qualitative preparation of workplaces for repair work.

3.2 The patrol-operator of turbine equipment is working according to the approved schedule.

Violation of the schedule of duty is FORBIDDEN.

The shift of duty is allowed only with the permission of the unit manager or his deputies, and duty for two shifts in a row is PROHIBITED.

In the event that the changer is not on duty, the patrol-operator of turbine equipment should inform the shift supervisor of this, continue on duty until the patrol-operator of turbine equipment arrives on duty.

3.3 When getting started, the patrol-operator of turbine equipment should take a shift from the previous patrol-operator of turbine equipment at the CCGT unit, and after the end of the work, take the next shift according to the schedule.

3.4. To get acquainted with the state of the scheme and the operating mode of the power plants in its operational control.

3.5 Obtain information from the person who takes the shift about the equipment, for which it is necessary to conduct an especially careful observation. In the future, to prevent violations in work and equipment stored in the reserve and repair.

3.6 Find out what works are performed according to orders on the area assigned to it.

3.7 Check and accept tools, materials, key of premises, operational documentation.

3.8 Familiarize yourself with all the records and orders from the time since your previous watch.

3.9 Report directly to the operator on the shift to enter on duty and the deficiencies identified when taking the shift.

Departure from duty without changing the change is FORBIDDEN!

3.10 Changing the Shift is FORBIDDEN:

3.10.1 During the liquidation of the accident.

3.10.2 With contaminated equipment.

3.10.3 In the implementation of responsible switching operations.

3.10.4 When the duty personnel enter service in a disabled state.

3.11. Change of the shift during the liquidation of the accident, in case of violation of the equipment operation mode in exceptional cases, is allowed with the permission of the unit manager or his deputy for equipment operation, shift supervisor or Station shift head.

3.12 To issue a receipt-delivery shift of a record in the journal or a statement after the signature of the transferee.

3.13 The patrol-operator of turbine equipment must perform constant monitoring of the operating mode of the steam turbine and its auxiliary equipment; take measures to reduce soaring, leakage of condensate, oils.

3.14 During the patrol of the equipment, the patrol-operator of turbine equipment of the CCGT unit performs control over the operation of mechanisms, pipelines, the condition of supports and suspensions, thermal displacements of steam pipelines; the density of the oil system of the steam turbine, the insulation of pipelines, the condition of the ladders, the sites, the condition of the safety valves, the presence of seals on the emergency shutdown buttons of the mechanisms, the loads of the safety valves, the controls of the oil system valves, fire-fighting equipment, lighting; vibration state of pump bearings; temperature of pump bearings and the state of turbine equipment; oil temperature on the drain from the bearings and behind the oil cooler; temperature of electric motors of pumps; condition of stuffing box seals; checks the safety of tags on the valve; posters on RULES OF SAFETY TECHNIQUES and locking devices on equipment under repair; the absence of open (not enclosed) openings in floors, ceilings, maintenance areas. All reported observations are reported to the auxiliary equipment operator and operator of the steam turbine for recording defects in the log, and also takes measures to eliminate them.

3.15 Every 2 hours, the patrol-operator of turbine equipment checks parameters (pressure, temperature, and so on) technical condition of the steam turbine and auxiliary equipment.

If the operation mode of the steam turbine is disrupted, the chemical regime of the steam entering the turbine is violated and the operating parameters and the Rules for the technical operation of the power plants and networks of the Republic of Uzbekistan do not match, the operator is informed about this and together they take measures to eliminate the violation of the regime.

3.16 To monitor the quality of oil in the oil tank of the steam turbine,

3.17 Observe the oil cooler, avoiding temperature deviation from the relevant coolant parameters.

This is controlled by the flow and pressure of the water in the cooler.

It monitors the vacuum in the condenser.

When the vacuum in the condenser decreases, with the auxiliary equipment operator takes the necessary measures to eliminate it.

3.18 Maintain clean workplaces, spill oil IMMEDIATELY

3.19. Control over the manufacture of repair work on the steam turbine and auxiliary equipment.

3.20 By order of the operator of auxiliary equipment and operator, the steam turbine performs shift tasks.

3.21 Do not allow unauthorized persons to enter the working area without an escort.

3.22 Take measures to prevent freezing of equipment at negative outdoor temperatures.

3.23 In case of emergency:

3.23.1. An emergency situation means a violation of the normal operation of equipment or individual units, which, if not taken timely, creates a threat to the safety of equipment, the uninterrupted operation of the station, and the safety of people.

3.23.2 Liquidation of the emergency situation at the CCGT is carried out under the supervision of the auxiliary equipment operator, the steam-turbine operator, the senior operator of the unit and the unit shift supervisor.

3.23.3 In the event of liquidation of an emergency situation, the patrol-operator of turbine equipment shall:

- find out the nature and scale of the emergency damage;
- as soon as possible to identify the cause and take measures to eliminate the accident;
- report the incident to the auxiliary equipment operator; operator of a steam turbine, a senior operator.

3.23.4 During the elimination of the accident, the patrol-operator of turbine equipment will take the necessary measures to successfully eliminate the emergency situation, ensuring people's safety and equipment safety, guided by the Rules of technical operation, job descriptions and production instructions, and in case of an unusual situation, makes decisions independently, depending on specific situation.

3.23.5 On the measures taken to eliminate the emergency situation, reports to the operator of auxiliary equipment, the operator of the steam turbine and the senior driver.

3.23.6 If, at the time of the occurrence of an accident, any repairs or tests were carried out, they must be immediately discontinued, and the people withdrawn.

In case of emergency, all personnel must be removed from the emergency control room and accident areas, except for personnel who have unhindered access to participate in the elimination of the accident,

3.23.7 If the emergency situation was created during the acceptance-delivery of the shift, then all the personnel taking the shift are placed at the disposal of the head of the liquidation of the accident.

3.23.8 In case of accidents with people, the patrol-operator of turbine equipment must immediately provide assistance to the victim in accordance with the instructions for providing first aid, inform the shift supervisor of the call for a doctor.

3.24 The patrol-operator of turbine equipment is involved in the manufacture of the necessary switching in the thermal circuits of the equipment under control, starting and stopping the main and auxiliary equipment, crimping, testing the equipment with the permission and under the supervision of the auxiliary equipment operator and steam turbine of the CCGT unit.

Participates in the preparation of a workplace for repair teams.

3.25 In the manufacture of repair work, the patrol-operator of turbine equipment shall:

3.25.1 Ensure the completeness of the fulfillment of the conditions for the production of work.

3.25.2 Perform periodic monitoring of working teams alongside and ordering.

3.25.3 To remove repair personnel from work activities when RULES OF SAFETY TECHNIQUE violations are found or the workplace is expanded by the members of the brigade.

3.25.4 To accept workplaces for cleanliness after the termination of repair work.

3.25.5 Take part in the acceptance of equipment from the installation.

3.26 Complies with the operational orders of the higher-level operational staff of the CCGT unit.

3.27 Increases technical knowledge and skills by attending advanced training courses in the study of best practices, participation in training exercises.

3.28 Participates in events, shows and competitions held in the CCGT unit.

3.29 Timely on schedule, take the next exams according to the rules and in the amounts specified in paragraph 2.7.

3.30 It is forbidden to engage in strangers during working hours, not related to the performance of official duties, affairs.

4 Rights

4.1 Stop the equipment in the event of an accident or fire that threatens the safety of the equipment or the life of the personnel.

4.2 In case of receiving an order directly from the director, chief engineer or other administrative person of the station, it executes it and informs the operator of the auxiliary equipment of the CCGT unit.

4.3 Do not comply with orders that are contrary to the requirements of the Rules for the Technical Operation of Electric Power Stations and Networks, Safety Regulations, Fire Safety Rules or pose a threat to the safety of people or the safety of equipment.

4.4 In case of disagreement with the received order, it has the right to appeal against it to the higher management, without suspending its execution, if this does not threaten damage to equipment and people's lives.

4.5 Remove unauthorized persons from the unit if they do not have an accompanying person.

5 Relationships

5.1 With administrative orders, the patrol-operator of turbine equipment should be familiar with or should be acquainted with the "Journal of administrative orders of the unit of the CCGT".

5.2 In operational telephone conversations with personnel, first of all, he names his position and surname, and then receives an order (message) or himself makes a communication.

Having executed the received order, the patrol-operator of turbine equipment is obliged to report this to the person who issued the order.

5.3 The patrol-operator of turbine equipment on duty performs all the administrative and technical orders of the unit manager of the CCGT and his deputy on the operation of equipment, the leading process engineer and operational orders of the auxiliary equipment operator, the operator of the steam turbine, the senior operator of the unit, the shift supervisor.

Upon receipt of the instruction (team) it is obliged to repeat it, execute and report on its execution to the operator.

5.4 If the patrol-operator of turbine equipment does not agree with the received order, he must notify the person who issued the orders, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

5.5 In the event that an order is received directly from the head of the unit, his assistant for the operation of equipment, the leading process engineer brings to the attention of the operator of auxiliary equipment or the operator of the steam turbine and carries out this order.

5.6 Disagreements that have not found a common solution can be resolved by the "Labor Disputes Commission".

6 Responsibility

6.1 The patrol-operator of turbine equipment is personally responsible for:

6.1.1 Untimely and substandard performance of the assigned functions, not the use of the granted rights;

6.1.2 Failure to comply with job description;

6.1.3 For their incorrect actions leading to an accident, damage to equipment, accidents, as well as for violation of the job description and production instruction, rules for Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY instructions and instructions from the management of the unit and power plant, rules of internal labor regulations, untimely passing of exams.

6.1.4 Cases of fire resulting from its improper actions,

6.1.5 Preservation of serviced equipment and devices, including the safety of fire fighting equipment.

6.2 The patrol-operator of turbine equipment unit CCGT, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility under the current legislation of the Republic of Uzbekistan.

Informational data

Developed by The Combined Cycle Gas Turbine Combine Plant of OJSC
"NTPP"

Head of unit	I.Kh.Abdulloev
Agreed	
Production and Technical Department	
Head of the department	T.H.Soliev
Planning and Economic Department	
Head of the Department	E.E.Davov
Service reliability of machinery and industrial safety	
Head of the service	Kh.O. Muminov
Senior Inspector for Labor Protection and Technology	
Security	T.Jumanazarov
Legal adviser	Sh.Y.Nazarov
Responsible for standardization	O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE OPERATOR OF COMPRESSOR UNITS OF
THE CCPP UNIT**

STOCK COMPANY SC « NTPP »

NAVOI

KSt 202- 826:2015

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCGT UNIT of JSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INSTEAD OF KSt 202- 826:2012

Approved

SC « NTPP » Chief engineer

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF THE OPERATOR OF COMPRESSOR UNITS OF THE CCPP UNIT

Term of validity from till

1 Application area

This instruction is based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Unified tariff-qualification reference book of works and occupations of workers, for the purposes of regulating functions, duties, rights and the responsibility of the compressor operator of the combined-cycle steam and gas-turbine unit (CCGTs) and is mandatory for the operator of compressor units, the patrol-operator of the GBCS, the senior operator of the CCGT unit, the unit shift supervisor and the engineering-technical personnel of CCGT.

2 General requirements

2.1 For the position of an operator of compressor units, persons accepted, who have a general secondary education, at least 18 years of age who have undergone a medical examination, are specially trained, systematically instructed, passed the examination of the qualification commission, who have an identity card in their hands, who have been trained and duplicated in accordance with the Rules for Organization of Work with Personnel at the enterprises of power production, registered Ministry of Justice of RUz from 04.10.2002 year № 1178.

2.2 The operator of compressor plants is appointed, occupying and relieving of his position.

2.3 The operator of the compressor plants is technically and administratively responsible to the head of the unit of the CCGT, to the head of the GBCS section and to the deputy head of the equipment maintenance department.

In the operational - the head of the station shift, the head of the shift unit CCGT.

The operator of the compressor units is promptly subordinated to the patrol-operators of the compressor units and the duty locksmiths of the GBCS.

2.4 The operator of the compressor units of the CCGT unit should know and be guided by its work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On approval of the rules for the use of electric and thermal energy";
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan », Tashkent 2011:

Section I Chapter I § 1-8 § 13-16;

Section II Chapter I,

- "Safety rules for the operation of thermal mechanical equipment of power plants of heating networks", Tashkent 2012 in the following volume:

Chapter I;

Chapter II;

Chapter III;

Chapter VI § 2B;

Appendices 2, 3, 4, 5, 6, 7, 16.

- "Safety rules when working with tools and devices."

Chapters 1, 3, 5, 6.

- "Fire Safety Rules for Power Enterprises", Tashkent, 2004.

- "Instructions for first aid to victims in connection with accidents in the service of power equipment."

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004. in the following volume:

Chapter I §1 paragraphs 1, 2.

§2 - 5, 6, 7, 8.

§3 - 9, 10.

§4 - 11, 12, 14.

§5 - 15, 16.

Chapter II §2 - 20, 21, 22, 23, 24, 25, 26, 27.

Chapter III § 1 - 28-37.

§2 - 38-46.

§3 - 47-53, 55, 59, 66, 70, 71, 73, 75-77, 81-85.

§4 - 86, 88-101.

§ 7 - 210-226.

§11 - 265, 266, 277.

§12 - 279-294.

Chapter V of paragraphs 310-351.

Chapter VI - 352-428.

Chapter VII - 429-441.

Appendices 1, 2, 8, 11, 12, 13, 14, 15, 16, 31, 32.

- "Rules and regulations for the operation of pressure vessels": Tashkent, 1997. in the following volume:

Section 1 subsections 1.1; 1.2.; 1.3.;

Section 2 subsections 2.1; 2.2.;

Section 3;

Section 4 subsections 4.6.-4.8.;

Section 5;

Section 6:

Section 7;

Section 10

Appendices 1, 3, 4.

- KSt 202-036-2007 "Rules of internal labor regulations employees of OJSC "NTPP";

- "Instruction on the provision of first aid rendered in holy accidents while servicing power equipment";

- The present instruction;

- Properties, marks and characteristics of used oils for lubrication of compressors;

- The scheme of the gas distribution network within the compressor;

- The principle of operation of the automatic control and redundancy of the compressor station.

- Purpose and principle of operation of instrumentation, signaling devices, technological protection.

- The territorial arrangement of the serviced equipment, pipelines, fittings, structures, vessels (receivers).

- Types of structures and technical characteristics of serviced compressors.

2.5 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job description and production instructions should be made:

- primary - before admission to independent work;

- Periodic-on time;
- Extraordinary - violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, supervisory authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least 1 time in 3 years.

2.6 The location of the compressor operator is the operator's building of the compressor station.

2.7 The service area is compressor units with auxiliary equipment and a gas pipeline within the gas compressor station.

3 Functions and responsibilities

3.1 Ensuring the reliability and safety of the compressor unit type ECA-C-8 / 12-49M1 and their communication;

3.2. Maintaining the set gas pressure at the outlet of the compressor unit.

- to monitor the cleanliness and condition of fire safety in the compressor station and on the territory adjacent to the compressor;
- timely identify all defects and malfunctions of compressor equipment and record them in the fault log.
- maintenance, monitoring of equipment operation by patrolling the purging of chillers and receivers;
- start-up, shutdown, testing of compressor units;
- participation and elimination of emergency situations, equipment withdrawal for repairs, commissioning after repairs;
- maintaining the cleanliness of equipment and fixed site.

3.3 When accepting a shift, the compressor operator must:

- get acquainted with the status, the scheme and the operating mode of the power plants that are in its operational control, in the volume defined by appropriate instructions;
- receive information from the person who takes the shift about the equipment, for which it is necessary to conduct especially careful monitoring, in

order to prevent violations in work, and about equipment being in reserve and in repair;

- to find out what works are performed according to the orders and orders in the area assigned to it;
- check and accept fire hoses, protective equipment, which are stored in the control room, operational documentation and workplace documentation;
- to get acquainted with all the records and orders for the time elapsed from their previous watch;
- to accept a report from the subordinate personnel on entering into duty and on the shortcomings revealed during the acceptance of the shift and to give the report to the shift supervisor of the CCGT unit;
- formalize the acceptance-delivery of the shift with the record in the statement for its signature and signature of the transferee.

Departure from duty without changing the shift is FORBIDDEN.

3.4 Starting and stopping, testing, crimping equipment.

3.5. Switching in the thermal and electrical circuits of the gas turbine CCGT.

3.6 Disconnecting the gas turbo generator and switching the power supply from the main to the backup and vice versa (in emergency situations).

3.7 Control over the readings of measuring instruments, the operation of auto regulators and signaling.

3.8. Detection of malfunctions in the operation of equipment and taking measures to eliminate them.

3.9 The operator of compressor installations in the event of emergency situations and the elimination of an accident shall:

- draw up a general idea of what happened, according to the signaling devices and external signs;
- eliminate the danger to personnel and equipment, up to the disconnection of the latter, if this becomes necessary;
- do not interfere with the operation of automatic devices;
- to ensure the normal operation of the main equipment remaining in the work, as well as the mechanisms of the own needs of the CCGT unit;
- find out the place, nature and extent of damage and disconnect damaged equipment;

- equipment that has shut down during an accident must be entered in the work immediately after finding and fixing its malfunctions, by order of the head of the shift unit of the CCGT;

- for each operation to eliminate accidents, the compressor operator must report to the shift supervisor without waiting for a survey.

3.10 Management of subordinate workers (patrol-operators and duty locksmiths)

3.11 Preparation of the workplace for repair.

3.12 Increase of technical knowledge, participation in technical training.

3.13 Keep your workplace clean.

3.14 Provision of first aid to the victim.

3.15 A shift-free operator of compressor units may be used as a patrol-operator after duplication and briefing.

3.16 In case of emergency:

3.16.1. An emergency situation means a violation of the normal operation of equipment or individual components, which, if not taken timely, creates a threat to the safety of equipment, the uninterrupted operation of the station, and the safety of people.

3.16.2. The emergency situation on the unit is eliminated under the supervision of the compressor operator, the senior operator of the unit and the shift supervisor.

3.16.3 When liquidating an emergency situation, the Compressor Unit operator shall:

- find out the nature and scale of the emergency damage;
- as soon as possible to identify the cause and take measures to eliminate the accident;
- Report on what happened to the senior operator, the head of the shift.

3.16.4 During the elimination of the accident, the compressor operator takes the necessary measures to successfully eliminate the emergency situation, ensuring the safety of people and safety equipment, guided by Rules of technical operation, job and production instructions, and in case of an unusual situation, makes decisions independently, depending on the specific situation.

3.16.5 On the measures taken to eliminate the emergency situation, reports to the senior operator and the shift supervisor.

3.16.6 If, at the time of the occurrence of an accident, any repair works or tests, they must be IMMEDIATELY DISCONTENT, people are withdrawn.

In an emergency situation, all other personnel should be removed from the accident sites, except for personnel who have unimpeded access to participate in the elimination of the accident.

3.16.7 If the emergency situation was created during the acceptance-delivery of the shift, all the personnel of the receiving shift are placed at the disposal of the head of the liquidation of the accident.

3.16.8 In the case of accidents, the Compressor operator is obligated to immediately provide assistance to the victim in accordance with the instructions for first aid, inform the compressor operator of the compressor systems for calling the doctor.

4 Rights

4.1 Give operational orders to a subordinate personnel and demand their execution.

4.2 Stop the equipment in the event of an accident or fire, threatening the safety of equipment or life of staff.

4.3 Represent the management of the unit through the head of the CCGT shift of the proposal on the promotion of subordinate personnel or the imposition of penalties on him.

4.4. Suspend work and remove from its workplace all persons who impede the normal operation of the equipment.

4.5 Do not follow orders that are contrary to the requirements of Rules of technical operation, RULES OF SAFETY TECHNIQUE or pose a threat to the safety of people or the safety of equipment.

4.6 Appeal in case of disagreement other orders, without suspending their implementation.

4.7 Shown to work according to the approved schedule.

It is FORBIDDEN to leave the watch without changing the shift.

5 Relationships

5.1 Carry out all operational orders of the shift supervisor of the CCGT and the Station shift head.

5.2 After receiving the shift, he reports to the shift supervisor of the CCGT on the telephone.

5.3 In case of emergency, the change of shift is FORBIDDEN.

5.4 If the order is received directly from the superior administrative officials, it executes it and brings it to the head of the CCGT shift, to the master or deputy head of the equipment operation department.

5.5 In case of operational telephone conversations with personnel he names his surname and position, and then receives an order or a message.

5.6 In case of short-term absence, if necessary during the day, warn the trainer with his replacement, and during the rest of the time the shift supervisor of the CCGT.

6 Responsibility

6.1 The operator of the compressor units of the CCGT unit, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202- 826:2015

Information data

Designed by The CCGT Unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of department

E. E. Davova

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Senior Inspector for Labor Protection and Technology
security

T. Zhumanazarov

Legal adviser

Sh. Y. Nazarov

Responsible for standardization

N. S. Nurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF COMPRESSOR
FACILITIES OF CCPP UNIT**

JOINT STOCK COMPANY "NTPP"
Navoi

KSt 202- 839:2015

Preface

1 DEVELOPED AND INTRODUCED by the CCGT UNIT of JSC
"NTPP"

2 APPROVED AND RUN by the Order of JSC "NTPP"
No. dated

3 INSTEAD of KSt 202- 839:2012

Approved by

Chief engineer of JSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF PATROL-OPERATOR OF COMPRESSOR FACILITIES OF CCPP UNIT

Valid from	to
-------------------	-----------

1 Field of application

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants," the Unified tariff-qualification reference book of works and occupations of workers, with a view to regulating functions, duties, rights and the responsibility of the patrol-operator of compressor facilities of the combined-cycle combined cycle gas turbine unit (CCGTs) and is mandatory for the patrol-operator of compressor units, operator of GBCS, senior operator of unit, unit shift head and CCGT Engineer-technical personnel.

2 General requirements

2.1 Persons who are at least 18 years of age and have undergone medical examination are admitted to the position of the patrol-operator of compressor facilities.

2.2. Prior to the assignment to independent work, the patrol-operator of compressor facilities must undergo industrial training according to a special training program. After completing the training, the patrol-operator of compressor facilities is subjected to the verification of knowledge by the qualification commission under the chairmanship of the unit manager or his deputy in the amount of necessary knowledge for the patrol-operator of compressor facilities. In accordance with the Rules for the organization of work

with personnel at energy production enterprises, registered by the Ministry of Justice of the Republic of Uzbekistan from 04. 10. 2002 № 1178.

2.3 After passing the examinations, the patrol-operator of compressor facilities must undergo duplication at the workplace of the patrol-operator of compressor facilities, for a period of not less than 12 shifts under the supervision of an experienced patrol-operator of compressor facilities. After the end of the period of duplication and with a positive evaluation of the emergency response training, the patrol-operator of compressor facilities, by order of the unit, is allowed to work independently.

2.4 The patrol-operator of compressor facilities is appointed, moved and dismissed from the position by the order of the director of the enterprise upon presentation of the head of the unit at the CCGT, human resources department, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.5 The patrol-operator of compressor facilities in production, technical and administrative respect submits to the head of the CCGT unit, the deputy head of the operation department, and to the head of the GBCS section, and in the operative - to the operator and to the shift supervisor of CCGT.

2.6 The patrol-operator of compressor facilities of the CCGT unit should know and be guided in its work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan from 12.01.1999 № 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on disciplinary liability workers of the Uzbek power system ";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011:
Section I Chapter I § 1-8 § 13-16;
Section II Chapter I,
- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks" in the following volume:
Section 1;
Section 2. Subsections 2.1., 2.2., 2.3., 2.5., 2.9.
- "Safety rules when working with tools and devices" in the following scope: Chapters 1, 3, 5, 6.
- "Fire safety rules for energy enterprises", Tashkent 2004;

- "Instruction on rendering first aid to victims in communication with accidents at service of the power equipment ";

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004, in the following volume:

Chapter I §1 paragraphs 1, 2;

§ 2 - 5, 6, 7, 8;

§3;

§ 4 - 11, 12, 14;

§ 5;

Chapter II § 2;

Chapter III § 1;

§2;

§3 - 47-53, 55, 59, 66, 70, 71, 73, 75-77, 81-85;

§4 - 86, 88-101;

§ 7;

§11 - 265, 266, 277;

§ 12;

Chapter V;

Chapter VI;

Chapter VII;

Appendices 1, 2, 8, 11, 12, 13, 14, 15, 16, 31, 32.

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", Tashkent 1997, in the following scope:

Section 1;

Section 2 subsections 2.1 .; 2.2 .;

Section 3;

Section 4 subsections 4.6.-4.8 .;

Section 5;

Section 6;

Section 7;

Section 10;

Appendices 1, 3, 4.

-KSt 202-036-2007 "Rules of internal labor regulations employees of JSC "NTPP";

- The present instruction.

2.7 The patrol-operator of compressor facilities of the CCGT should know:

- Properties, marks and characteristics of used oils for lubrication of compressors;

- The scheme of the gas distribution network within the compressor;

-Principle of operation system of automatic control and backup of the compressor station;

- Purpose and principle of operation of instrumentation, signaling devices, technological protection;

- The territorial arrangement of the serviced equipment, pipelines, armature, structures, vessels (receivers);

- Types of structures and technical characteristics of serviced compressors.

2.8 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;

- an extraordinary one - in case of violation of the rules and instructions, at the request of the state supervision bodies, the State Inspectorate for the operation of power plants and networks and the higher management bodies, as decided by the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once in 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, device rules and safe operation of equipment controlled by SI

"Sanoatkontehnazorat", the following: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.9 The location of the patrol-operator of compressor facilities is the operator's office of the compressor station.

2.10 The service area is compressor units with auxiliary equipment and a gas pipeline within the gas compressor station.

3 Functions and responsibilities

3.1 The operator of the compressor units is the person responsible for the correct, reliable, economical and accident-free operation of compressor plants and its auxiliary equipment; for timely and qualitative preparation of workplaces for performance of repair work.

3.2 The patrol-operator of compressor facilities works on the approved schedule.

Violation of the schedule of duty is FORBIDDEN.

The shift of duty is allowed only with the permission of the unit manager or his deputies, and duty for two shifts in a row is PROHIBITED.

In the event that the replacement is not on duty, the patrol-operator of compressor facilities is obliged to inform the shift head about this, continue on duty until the arrival of the patrol-operator of compressor facilities, called for on duty.

3.3 In its work, the patrol-operator of compressor facilities is guided by existing operational and production instructions and other directive materials, as well as orders and instructions from the management of the unit, senior operational personnel.

3.4 Getting Started, The patrol-operator of compressor facilities should:

3.4.1 Accept a shift from the previous patrol-operator of compressor facilities at the GBCS site, and after the end of the work, take the next shift according to the schedule;

Departure from duty without changing the change is FORBIDDEN!

3.4.2. Familiarize yourself with the state of the scheme and the operating mode of the power plants in its operational management;

3.4.3 Obtain information from the person taking the shift about the equipment, for which it is necessary to carry out a very careful monitoring; In the future, to prevent violations in work and equipment that is in reserve and repair;

3.4.4 Find out what works are performed according to orders and orders in the area assigned to it;

3.4.5 Check and accept tools, materials, key of premises, operational documentation;

3.4.6. To get acquainted with all the records and orders during the past from their previous watch;

3.4.7 Report directly to the operator on the shift of attendance on duty and the shortcomings revealed when taking the shift.

3.5 Delivery of the shift is FORBIDDEN:

3.5.1 During the liquidation of the accident;

3.5.2 In case of contaminated equipment;

3.5.3 In the manufacture of responsible switching operations.

3.6 When entering duty personnel in a disabled state, the change of the shift is FORBIDDEN.

3.7 Delivery of the shift during the liquidation of the accident, in case of violation of the equipment operation mode, in exceptional cases, is allowed with the permission of the unit manager or his deputies, the unit shift supervisor or the station shift head.

3.8 Make a receipt-change delivery shift in the journal or the statement after the signature of the transferee.

3.9 The operator of the compressor units is obliged to ensure the reliability and safety of the compressor unit type ECA-C-8 / 12-49M1 and its communication.

3.10 During the patrol of the equipment, the operator of the compressor units of the GBCS section monitors the operation of the mechanisms, gas pipelines, the condition of the supports and suspensions, the density of the oil systems, the condition of the stairs, the areas, the condition of the safety valves, the presence of seals on emergency shutdown mechanisms, handles of oil system valves, fire fighting equipment, lighting; vibration state of pump bearings; temperature of pump bearings and the status of auxiliary equipment; oil temperature on the drain from the bearings and behind the oil cooler; temperature of electric motors of pumps; condition of stuffing box seals; safety of tags on the valve; posters on RULES OF SAFETY TECHNIQUEs and locking devices on equipment under repair; the absence of open (not enclosed) openings in floors, ceilings, maintenance areas.

3.11 Report all comments to the patrol-operator of compressor facilities for writing to the defects log, and take measures to eliminate them.

3.12 Every 2 hours. The patrol-operator of compressor facilities captures the parameters (pressure, temperature, etc.) of the technical condition of the compressor units.

3.13 It monitors the quality of oil in oil tanks.

3.14 Maintains cleanliness of jobs, spilled oil removes immediately.

3.15 Monitor the production of repair work on compressor plants and auxiliary equipment.

3.16 At the disposal of the patrol-operator of compressor facilities, the refueling tasks are performed.

3.17 Does not allow unauthorized persons to enter the area of the operating equipment without an escort.

3.18 Take measures to prevent freezing of equipment at negative outdoor temperatures.

3.19 The operator of the compressor units participates in the production of the necessary switching in the gas circuits of the equipment under control, starting and stopping of the main and auxiliary equipment, crimping, testing the equipment with the permission and under the supervision of the patrol-operator of compressor facilities of the GBCS section. Participates in the preparation of a workplace for repair teams.

3.20 In case of emergency:

3.20.1. An emergency position means a violation of the normal operation of equipment or individual units, which, if not taken timely, creates a threat to the safety of equipment, the uninterrupted operation of the station, and the safety of people.

3.20.2 Liquidation of the emergency situation at the GBCS is carried out under the supervision of the patrol-operator of compressor facilities, the senior operator of the unit and the shift supervisor.

3.20.3 In the event of an emergency, the patrol-operator of compressor facilities shall:

- find out the nature and scale of the emergency damage;
- as soon as possible to identify the cause and take measures to eliminate the accident;
- report on what happened to the compressor operator; to the senior machinist.

3.20.4 During the elimination of the accident, the compressor engine operator takes the necessary measures to successfully eliminate the emergency situation, ensuring the safety of people and the safety of equipment, guided by the Rules of technical operation, official and production instructions, and in case of an unusual situation, makes decisions independently, depending on the specific situation.

3.20.5 On the measures taken to eliminate the emergency situation, the patrol-operator of compressor facilities and the senior operator are reported.

3.20.6 If, at the time of the occurrence of the accident, any repair work or test, they must be IMMEDIATELY DISCONTENT, people are withdrawn.

In case of emergency, all other personnel should be removed from the accident sites, except for personnel having unhindered admission for participation in the liquidation of the accident.

3.20.7. If the emergency situation was created during the acceptance-delivery of the shift, all the personnel of the receiving shift are placed at the disposal of the head of the liquidation of the accident.

3.20.8 In case of accidents, the patrol-operator of compressor facilities must immediately provide assistance to the injured person in accordance with the instructions for first aid, inform the compressor operator of the compressor equipment to call the doctor.

3.21 In the manufacture of repair work The patrol-operator of compressor facilities of compressor installations is obliged:

3.21.1 Ensure the fulfillment of the conditions for the production of work.

3.21.2. Perform periodic monitoring of working teams alongside and disposition.

3.21.3 To remove repair personnel from work activities in case of detection of RULES OF SAFETY TECHNIQUE violations or expansion of the workplace by team members.

3.21.4 To accept workplaces for cleanliness after the termination of repair work.

3.21.5 Take part in the acceptance of equipment from the installation.

3.22 Complies with the operational orders of the higher-level operational staff of the CCGT unit.

3.23 Increases technical knowledge and skills by attending advanced training courses in the study of best practices, participation in training exercises.

3.24 Participates in events, shows and competitions held in the CCGT unit.

3.25 Timely on schedule, take the next examinations according to the rules and in the amounts specified in clause 2.5.

3.26 It is forbidden to engage in strangers during working hours, not related to the performance of official duties, affairs.

4 Rights

4.1 Suspend work and remove all persons who impede normal operation, testing and maintenance of equipment.

4.2 Do not comply with orders that are contrary to the requirements of Rules of technical operation, RULES OF SAFETY TECHNIQUE or pose a threat to people's safety or equipment reliability.

4.3 Stop the equipment in the event of an accident or fire that threatens the safety of the equipment or the life of the personnel in accordance with the instructions for the elimination of emergency situations.

4.4 Do not comply with orders that contradict the requirements of RULES OF SAFETY TECHNIQUE, Rules of technical operation or pose a threat to the

safety of people or the safety of power equipment, appeal in case of disagreement other orders, without suspending their implementation.

4.5 Go to work according to the approved schedule.

5 Relationships

5.1 Carry out all operational orders of the operator and the shift supervisor of the CCGT unit.

5.2 After acceptance of the shift, notify the compressor operator of this.

5.3 If the order is received directly from the higher-level administrative officials, it executes it and brings to the attention of the compressor operator.

5.4 In operational telephone conversations with staff, he first of all names his surname and position, and then receives an order or a message.

6 Responsibility

6.1 The patrol-operator of compressor facilities is responsible for:

6.1.1 Untimely and substandard performance of the assigned functions, not the use of the granted rights;

6.1.2 Failure to comply with job description;

6.1.3. For their incorrect actions leading to an accident, damage to equipment, accidents, as well as for violation of the job description and production instruction, rules for Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY instructions and instructions of the unit and power plant management, internal labor regulations, late exams .

6.1.4 Tanning incidents resulting from improper actions,

6.1.5 Preservation of serviced equipment and devices, including the safety of fire equipment.

6.2 The patrol-operator of compressor facilities of the GBCS section, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility in accordance with the current legislation of the Republic of Uzbekistan.

KSt 202-839: 2015

Informational data

Designed by the CCGT unit of JSC "NTPP"

Head of unit	I. Kh. Abdulloev
Agreed	
Production and Technical Department	
Head of the department	T.H.Soliev
Planning and Economic Department	
Head of the Department	E.E.Davov
Service reliability of machinery and industrial safety	
Head of the service	Kh. O. Muminov
Legal adviser	Sh.Y.Nazarov
Responsible for standardization	N.S.Nurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF THE HEAD OF GAS BOOSTING COMPRESSOR
STATION OF CCPP UNIT**

STOCK COMPANY SC «NTPP»

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCGT UNIT of JSC "NTPP"
- 2 APPROVED AND RUN IN BY the order of SC « NTPP » №
- 3 INSTEAD OF KSt 202- 818:2012

Approved

SC « NTPP » Director

K. Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF THE HEAD OF GAS BOOSTING COMPRESSOR STATION OF CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants", the Qualification Reference Book for the positions of managers, specialists of employees 1987, for the purposes of regulating the functions, duties, rights and responsibilities of the head of the gas boosting compressor station of the CCGT and is mandatory for him.

2 General terms

2.1 The head of the gas boosting compressor station of the Combined Cycle Gas Turbine Combine Plant (GBCS CCGT) coordinates and controls the production and economic activities of the plots, ensures technically correct operation of equipment and labor safety her fixed assets.

2.2 A person with a higher technical education and at least 3 years of professional experience in engineering and technical positions at least 3 years or a specialized secondary education and at least 5 years of experience in engineering positions are appointed to the position of the head of the GBCS CCGT section.

2.3 The head of the GBCS section of the CCGT is appointed to the position, moved and dismissed from the position by the director of the station upon presentation of the head of the CCGT, HR department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The head of the GBCS section of the CCGT is administratively and technically subject to the head of the CCGT unit.

2.5 In the event of a long absence of the head of the gas boosting compressor station, his duties are assigned to the maintenance master of the GBCS.

2.6 head of the gas boosting compressor station of the CCGT should know and be guided in its work:

- Indication of PP - 56;
- The Law of the Republic of Uzbekistan "On Industrial Safety of Hazardous Production Facilities" of 28.09.2006 No.Z RUz-57;
- CTX 13-58-2009 "Rules for the Organization and Implementation of Production Control at Hazardous Production Facilities" Tashkent 2009;
- "Regulations on the investigation and recording of accidents and labor safety her injuries to workers' health at work" approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent, 2011;
- Section I Chapter I. § 1-16;
- Section II Chapter 2. § 4;
- Chapter 3. § 1, 3, 4, 5, 7, 8, 9, 11, 12, 13;
- Chapter 4 § 1, 2, 12, 13, 14;
- Chapter 5 § 1-6;
- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012 in the following volume:
 - Chapter I.
 - Chapter 2 § 1, 2;
 - Chapter 3 § 1-6, 9-14;
 - Chapter 4 § 2, 3, 4, 6, 8, 9.

Appendix: 2-8, 9.10, 11, 13-17, 19
- "Safety rules in the gas economy of the Republic of Uzbekistan",
Tashkent 2004;
Chapter I. General Provisions. § 1, 2, 4, 5;
Chapter III. Operation of gas facilities. § 1, 2, 3, 4.7;
Chapter VI. Gas hazardous work. Appendices 1, 2, 31, 32.

- "Fire safety rules for energy companies", Tashkent 2013;

Chapter I;

Chapter II;

Chapter III;

Chapter IV;

Appendix No. 1

Section I § 1, 2;

Section II §4 paragraph 99, §6;

Section III § 2;

Section IV § 1;

Section V § 2;

Section VI §2;

Applications Nos. 2, 3, 4, 5, 8.

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", 2011, in the amount of:

Chapter I. § 1;

Chapter 3. § 1, 2;

Chapter 4.

Chapter 5 § 1, 2;

Applications: 1, 2, 3, 6, 9, 10, 13, 14, 15;

- "Rules for the Arrangement and Safe Operation of Steam and Hlabor safety Water Boilers", Tashkent, 1997, in the amount of:

Section 1. 1.1. - 1.4 .;

Section 2.

Section 3. 3.1. - 3.6 .;

Section 4. 4.1 .; 4.7 .;

Section 5. 5.1 .;

Section 6.

Section 7. 7.1. 7.4 .;

Section 8. 8.1. - 8.3 .;

Section 9.

Section 10.

Appendices 1, 2, 3, 4, 6.

- "Instruction on rendering first aid to victims in connection with accidents in the maintenance of power equipment "

- Occupational safety standards system;
 - "Explosion safety rules for the use of gas, fuel oil in boiler plants ";
 - "Safety rules when working with the tool and adaptations ";
 - Production and job descriptions of sites;
 - The Labor Code of the Republic of Uzbekistan, Tashkent, 1996;
 - RH 34 - 400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry";
 - RH 34 - 475: 2007 "Rules of internal labor regulations employees of the executive apparatus of the State Joint Stock Company "Uzbekenergo", its branch "Energosotish" and unitary enterprises ";
 - Rules of organization of work with personnel at enterprises of energy production registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;
 - Directive materials, operational and emergency circulars of SJSC "Uzbekenergo";
 - Orders, orders of JSC "NTPP", and labor safety her administrative documents;
 - KSt 202-032: 2008 "Rules for working with low-sulfur gas";
 - RN 34-114: 2007 "Regulations on disciplinary liability workers of the Uzbek power system ";
 - Guidance document for the production of repair work (GDPRW);
 - KSt 202 - 038: 2008 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity ";
 - KSt 202 - 036: 2007 "Rules of internal labor regulations employees of JSC "NTPP";
- 2.7 The head of the gas boosting compressor station should know:
- design and features of operation and performance characteristics of all main and auxiliary equipment of the GBCS CCGT site;
 - technological diagrams of the equipment of GBCS CCGT;
 - location of fire extinguishing means and fire water supply system;
 - electric circuit of the gas-turbine unit of the CCGT;
 - per diem, monthly, quarterly and annual technical and economic indicators and planned tasks of the unit;
 - designation and operation principle of the equipment of the GBCS CCGT Unit of the instrumentation, signaling devices, interlocks, automation, protection;
 - The territorial location of equipment, pipelines and fittings of the GBCS CCGT site;
 - the fundamentals of economics, organization and management.
- 2.8 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY should be carried out:
- primary - before admission to independent work;
 - Periodic - on time;

- Extraordinary - in violation of rules and regulations, at the request of the SI "Sanoatkontekhnazorat", "Uzdavenergonazorat", higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of RULES OF SAFETY TECHNIQUE knowledge testing, device rules and safe operation of equipment controlled by SI "Sanoatkontekhnazorat" - once a year.

2.9 Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.10 The location of the Head of the GBCS section of the CCGT is located in the building of the GBCS Operator Station of the CCGT.

2.11 Service zone - the whole territory of the equipment location of the GBCS CCGT: gas-compression compressor plant, separator filters, air-cooling unit, compressed air compressor with receivers, nitrogen plant, dust collectors and gas pipelines on the territory of the GBCS section to the gate valves of the gas pipeline of the station.

3 Functions and responsibilities

3.1 Controls the operation and condition of equipment, mechanisms, devices and premises under its control, patrolling and inspecting, in order to detect and resolve problems in a timely manner.

3.2 Provides maintenance of the specified mode of operation of the site equipment.

3.3 Conducts prompt and technical maintenance of the equipment attached to the site.

3.4 Take measures to eliminate damage and eliminate the emergency condition of the equipment.

3.5 Participates in the investigation of the causes of accidents and failures in the operation of the compressor unit, records and analyzes them, and organizes emergency repairs.

3.6 It monitors the serviceable condition of fire fighting equipment.

3.7 Keeps track of the cleanliness of the equipment, premises and territory assigned to the site.

3.8 Participates in the development of annual and long-term plans repair, reconstruction and modernization of the thermal mechanical equipment of the site, as well as in the organization and implementation of measures for science and new technology, occupational safety and safety.

3.9 Performs organizational, technical measures for preparation and withdrawal of the site equipment in capital, medium, current repairs.

3.10 Supervises the quality, volume of repair work carried out by the centralized repair area, contractors, and also keeps a record of the required materials, spare parts.

3.11 Carry out the acceptance of the equipment after repair performed by all repair sites of JSC "NTPP", contractors and foreign companies.

3.12 Carries out a claim work in case of poor repair by contractors and foreign companies.

3.13 Keep records and report on the production activities of the site, maintains technical documentation.

3.14 Determines the amount of knowledge and safety instructions for all occupations and positions of workers, employees and engineers of the site, submits to the coordination with the trade union committee, unit management and for approval to the management of the station, organizes a timely review of them and provides them with jobs, requires their implementation and compliance.

3.15 Provides safe working conditions during operation, maintenance, repair of equipment, buildings, structures and in the management of technical processes.

3.16 Every day he gets acquainted with the records in the operational journal of the site, in the journal of equipment defects, on the status of SAFETY TECHNIQUE and industrial sanitation, visits them, and ensures the elimination of shortcomings.

Requires a report from the master and the senior shift operator at the beginning of the day on the state of SAFETY TECHNIQUE, technological processes of equipment, remedies, violations of SAFETY TECHNIQUE measures, norms and safe methods of work.

3.17 Timely organizes the study by workers and engineers of new and revised instructions and labor safety her documentation on labor protection, exercises control over their implementation.

Provides workplaces with operational journals, instructions, maps, diagrams, posters, safety signs, means for training jobs, and controls their safety and maintenance.

3.18 Participates in monthly safety precautions, fire safety. Supervises the observance of labor and production discipline and the implementation of instructions RULES OF SAFETY TECHNIQUE, immediately suppresses the violation of their operational personnel.

3.19 Weekly checks the condition of workplaces, tools, protective equipment, ventilation system, takes measures on elimination of the revealed infringements.

3.20 Take measures to reduce the level of harmful factors, ensure the proper operation of ventilation and heating systems, a normal microclimate, the illumination of workplaces. Carries out the maintenance of the passport of the sanitary and technical state in the unit.

3.21 Ensure timely management of all types of training, briefing, testing of staff knowledge. Participates in the commission to check the knowledge of workers, issues orders for admission to independent work.

3.22 Immediately informs the head of the unit and the management of the station about an accident, participates in the commission for its investigation, draws up the acts on accidents, develops measures to prevent them and directs them to the management of the unit for approval.

3.23 At the site meetings, discusses the state of LABOR SAFETY and SAFETY TECHNIQUE, industrial sanitation, morbidity, violations, orders, orders.

The staff of the site with injuries reviews and labor safety her documents on HSE are informed.

3.24 Organizes timely medical examination by the site staff.

3.25 Imposes penalties on the employees of the site for violation of LABOR SAFETY and SAFETY TECHNIQUE, instructions. Represents materials to encourage employees for active assistance in compliance with RULES OF SAFETY TECHNIQUE.

3.26 Works on the development of rational work, study and implementation of advanced labor methods and experience of innovators in the energy sector.

3.27 Organizes the holding of days of SAFETY TECHNIQUE, the work and equipping of cabinets and corners for SAFETY TECHNIQUE literature, manuals.

3.28 Supervises observance of labor and industrial discipline, implementation of instructions, regimes, RULES OF SAFETY TECHNIQUE, industrial sanitation, immediately suppresses their violation.

3.29 Daily checks selectively the preparation of jobs.

3.30 Organize the provision of workers with personal protective equipment, safety devices, soap, drinking water, coupons for milk.

3.31. Once a month, in conjunction with the chairman of the departmental committee (senior engineer for labor safety and safety technique), in order to implement the second stage of control, conduct a check on the condition of labor and safety conditions on the site, assess the work of the 1st stage of control.

3.32 Stops the operation of the units when creating hazardous conditions. Controls the correctness of issuing orders, orders for the production of works.

3.33 Ensures compliance with prescribed requirements, activities on SAFETY TECHNIQUE, stipulated by acts, orders and the like.

3.34 Prepares an annual plan of measures for the protection of labor and technology safety, industrial sanitation.

4 Rights

4.1 Take urgent measures to stop or reduce the load equipment, to stop the production of works by employees of the site in case of danger to people and equipment.

4.2 Discontinue work on the equipment and suspend from the work of persons violating safety regulations, fire safety or in the absence of a proper permit (order).

4.3 Issue outfits and give orders for implementation repair work on the equipment of the GBCS section.

4.4 Apply for withdrawal to repair equipment.

4.5 Make suggestions to the unit manager about imposing penalties for persons whose actions are unlawful or negligent attitude towards their duties led or could lead to spoilage or unjustified disconnections of the equipment of the GBCS site.

4.6 Sign the planned or reporting documents of the site.

4.7 Make suggestions to the unit manager and participate in the development of measures aimed at fulfilling the main tasks of the site, improving its technical and economic indicators, improving the working conditions of the site staff.

4.8 Give technical and administrative orders to subordinate staff.

4.9 Control compliance with the workplace workers and the workplace, the requirements of rules and regulations on labor protection, technology, safety and industrial sanitation.

4.10. Make proposals through the unit manager to the management of JSC "NTPP" about the hiring, dismissal and relocation of the site staff in accordance with the current legislation.

4.11 Encourage or make suggestions to the unit manager on the promotion of distinguished employees of the site.

4.12 Impose disciplinary sanctions against violators of labor and production discipline through the head of the unit.

5 Relationships

5.1 Relationships between the head of the GBCS section of the CCGT are carried out in accordance with this job description and KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine plants".

6 Responsibility

6.1 The head of the section of the gas compressor station of the combined cycle gas turbine plants should comply with the requirements of the current legislation in the activities of subordinated personnel.

6.2 Head of the gas boosting compressor station of the unit combined-cycle steam and gas turbine plants to disciplinary, administrative and labor safety her measures of liability for non-fulfillment or improper performance of their

functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and labor safety her adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Information data

Developed by

The CCGT unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of department

EE. Davova

Service reliability of machinery and industrial safety

Head of Service

Kh. O. Muminov

Legal Advisor

Sh.E. Nazarov

Responsible for standardization

N. S. Nurullaeva

KSt 202- 818:2015

COMPANY STANDARD

**JOB DESCRIPTION OF THE REPAIR MASTER OF THE THERMAL-
MECHANICAL EQUIPMENT OF THE GAS BOOSTING COMPRESSOR
STATON OF CCPP UNIT**

STOCK COMPANY SC «NTPP»
NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCGT UNIT of JSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC «NTPP» №
- 3 INSTEAD OF KSt 202-836:2012

Approved

Chief engineer SC «NTPP»

T.G.Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF THE REPAIR MASTER OF THE THERMAL-MECHANICAL EQUIPMENT OF THE GAS BOOSTING COMPRESSOR STATION OF CCPP UNIT

Expiration date from	till
----------------------	------

1 Application area

This manual is developed based on KSt 202-810: 2011 Regulations for the Combined Cycle of Gas Turbine Units, the Qualification Reference Book for Leaders, Employee Specialists 1987, for the purpose of regulating the functions, duties, rights and responsibilities of the repairman for the thermal mechanical equipment (TME) of the gas boosting compressor station of the combined cycle gas turbine plants, and is mandatory for him.

2 General terms

2.1 The repair master of the TME ensures the readiness of the equipment to a high degree of reliability and economy.

2.2 The repair master of the TME must have a higher technical education and work experience at least 1 year, or secondary specialized education and work experience at least 3 years.

In the absence of special education, the work experience in the industry is at least 5 years.

2.3 The repair master of the TME is appointed to the post, moved and dismissed from the position by the order of the general director of the station upon

presentation of the head of the unit of the CCGT, personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The repair master of the TME in production and technical respect submits to the head of the GBCS section, administratively reports to the head of the CCGT unit, and to the deputy head of the CCGT unit on repair.

2.5 A group of duty locksmiths at the GBCS site are subordinated to the repair master of the TME in production and technical terms.

2.6 The repair master of the TME must know and be guided in his work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011, in the following scope:

Section 1 Chapter 1; §1-16

Section 2 Chapter 1; §1-2

Chapter 3 paras. 1,7,9,13;

Chapter 4 paras. 2.12.14;

Chapter 5.

- "Safety rules for operation thermal mechanical equipment of power stations and heat networks »Tashkent 2012, in the following volume:

Chapter I

Chapter II, III § 1, 2, 3, 4, 6, 9, 11, 12, 13;

2

KSt 202-836: 2015

Chapter IV § 2 B, D; § 3 B; § 4 A, B; § 8, 9;

Appendix No. 2, 3, 4, 5, 6, 7, 10, 11, 15, 16, 17;

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004, in the following volume:

Chapter I §§1.2, §3, §4;

Chapter II§ 1, §2;

Chapter III §§4§ 7;

Chapter V;

Chapter VI;

Chapter VII;

Annexes 1,2,19,30,31,32.

- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure", Tashkent 2011 in the following scope:

Chapter I § 1;

Chapter III § 1, 2;

Chapter V § 1, 2,

Appendix No. 3 § 1, 2;

Appendix No. 13;

Appendix No. 14;

- "Safety rules when working with tools and devices";

- "Fire Safety Rules for Power Enterprises", Tashkent 2013;

- "Instruction on fire safety measures for fire works at power facilities";

- "Explosion safety rules for the use of gas, fuel oil in boiler plants";

- The present job description, "Regulations on the CCGT unit", job descriptions and production instructions of all subordinate personnel;

- KSt 202-036-2007 "Rules of internal labor regulations of employees of JSC "NTPP";

- RH 34-304-258: 2010 "Typical instructions. Contents and application of primary fire extinguishing means at electric power facilities ";

- "Instructions for the investigation and recording of fires that occurred at energy facilities";

- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;

- Orders and orders of NTPP;

- Directive materials of SJC "Uzbekenergo", operational and emergency warnings, emergency orders and others;

- "Rules for the organization of work with personnel at energy production enterprises", registered by the Ministry of Justice RUz on 04.10.2002 № 1178;

- KSt202-038: 2008 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity";

- The Labor Code of the Republic of Uzbekistan, Tashkent 1996;

- "Typical instruction for control and prolongation of the service life of the main components of boilers, turbines and pipelines of thermal power plants".

- "Instructions for first aid for victims in connection with accidents in the maintenance of power equipment";

2.7 The repairman for the thermal mechanical equipment of the GBCS section of the CCGT unit should know:

2.7.1. Design, operating characteristics and performance characteristics of the main and auxiliary equipment of GBCS.

2.7.2 Technological diagrams of equipment.

2.7.3 Arrangement of fire extinguishing means and systems water supply of the GBCS section.

2.7.4 Daily, monthly, quarterly annual technical-economic indicators and planned targets for them.

2.7.5 Geographical location of equipment (gas-boosting compressor unit, pipelines, filter-separators, compressed air compressor, ABO coolers, etc.).

2.8 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work,
- Periodic - on time,
- an extraordinary one - in case of violation of rules and instructions, at the request of the State Supervision Authority, the State Energy Inspectorate, higher officials of the administration, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoategeocontechnazorat" - once a year.

2.9 Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.10 The workplace of the repairman for the TME of the GBCS section is located in the operator building of the GBCS section.

2.11 Service area - equipment of the GBCS site.

3 Functions and responsibilities

3.1 Participates in drawing up annual repair schedules equipment, as well as in the program before and after repair work.

3.2 Participates in drawing up annual applications for materials, spare parts for reconstruction and technical re-equipment.

3.3 Controls the completeness of the work sheets for capital, current and emergency repairs.

3.4 Controls the completeness of volumes and quality of repair work, takes part in the acceptance of equipment.

3.5. It monitors the maintenance of repair documentation (passports, forms) of basic and auxiliary equipment.

3.6 Determines the possibility and need for repair of auxiliary equipment, coordinates the scope of repairs with the Central Repair Unit(CRU), monitors the implementation of organizational and technical measures to remove equipment for repairs.

3.7 Participates in the implementation of measures to improve fire safety equipment of the GBCS section.

3.8 Participates in compiling monthly work plans for the CRU and contracting organizations.

3.9 Prepares the equipment of the GBCS site for technical inspection by the inspectors of "Sanoatgeocontechnazorat" and the station commission.

3.10. It monitors the operational elimination of defects in the operation of the equipment of the GBCS site in fault logs.

3.11 Periodically supervises the observance of RULES OF SAFETY TECHNIQUE by the staff of the CRU and the contracting organizations with the measures taken against the offenders.

3.12It conducts regular patrol of the equipment of the GBCS section.

3.13Organizes and verifies the work of the personnel of the repair group of the GBCS section in accordance with the "Rules for the organization of work with personnel at energy production enterprises".

3.14 Implements in accordance with the provisions of the CCGT unit leadership led by the group; Ensures that the group fulfills planned tasks within the established timeframe; increase in labor productivity; rational use of materials, fuel, energy; normalizes their work and compiles a report for the month.

3.15 Organization of the introduction of advanced methods and techniques of labor, combining professions, attestation and rationalization of workplaces and other elements of scientific organization of work.

Ensures the fulfillment of the working standards of working out, the correct use of organizational and technical measures, the correct use of organizational technical toolings (tooling and tools).

3.16Provides industrial instruction of workers, conducts measures to implement the rules of labor protection, safety and industrial sanitation, technical operation of equipment and tools, as well as monitoring their compliance.

3.17 Promotes the application of progressive forms of labor organization, introduces proposals for assigning workers in accordance with the ETCS, participates in the tariffing of works and assignment of qualification categories to working day groups.

3.18 Analyzes the results of production activities: controls the expenditure of the wage fund to the established group, ensures the correctness and timeliness of the preparation of primary documents for the recording of working hours.

3.19 Promotes the dissemination of best practices, attentions, the development of creative plans, the introduction of rationalization proposals and inventions.

3.20 Ensures timely review in accordance with the established procedure of labor cost norms, the introduction of technically sound norms and standardized tasks.

Takes part in the implementation of works to identify the reserves of production, in the development of measures to create favorable working conditions, enhance the culture of production, and rational use of working time.

3.21 Ensures compliance with the working requirements of the rules and instructions of safety engineering and the application of safe methods in the performance of work.

3.22 Daily checks for serviceability and correct operation of equipment, mechanisms.

Takes measures to eliminate the identified shortcomings.

In cases where malfunctions in the operation of the equipment can not be eliminated and there is a clear danger to the workers, DO NOT carry out the work, and the repairman of the TME notifies the site manager about it.

3.23 It organizes preventive maintenance of equipment that ensures its safe operation.

3.24 Receives (issues) work orders-permits and orders for the production of works that require their registration, and does not allow the execution of such works without obtaining the necessary permits.

3.25 Organizes periodic and unscheduled briefings, briefings at workplaces on safe methods of work with their registration in the briefing book, attire-admission.

3.26 Before starting work, checks compliance with safety requirements for tools, equipment, mechanisms, safety devices, protective equipment, scaffolding, decking, and other devices intended for repair.

DO NOT use them until the defects are solved.

3.27. Provides warning equipment on the equipment and corresponding shut-off devices on maintenance of repair works, as well as fences and other safety precautions.

3.28 Carries out continuous supervision and direct management of work or the performance of its individual stages in cases provided for in the safety regulations.

3.29 Every day, at the beginning of the working day, in conjunction with the public inspector for labor protection, in order to carry out the first stage of control, checks the personnel compliance with safety regulations, the use of overalls and special footwear, the necessary devices identified by the previous test.

When there is disobedience on the part of individual workers in observance of safe methods of work, removes them from work, makes representation with imposing penalties, conducts emergency instruction in safety precautions.

3.30 Ensures cleanliness and order in workplaces, in the aisles, and on access roads, as well as sufficient illumination of workplaces, correct maintenance of crane tracks with systematic (daily) inspection of working conditions of workers. Takes measures to eliminate the identified shortcomings.

3.31 Controls compliance with the norms of carrying loads, including women and adolescents, providing jobs with safety signs, warning inscriptions and posters.

3.32 Also measures against the possible presence of outsiders in the territory of the site of work, in production premises and at workplaces.

3.33 Daily reviews of logs on the status of equipment, violations of safety rules and production sanitation, visits them, determines the measures and gives the task to eliminate the defects, malfunctions, violations.

3.34 Increases the causes of violations of safety rules in the conduct of work, parses them with staff and determines measures to prevent further.

3.35 Participates in the development for workplaces and professions of safety instructions for maintenance work during repair.

3.36 Ensures the fulfillment in due time of prescriptions and measures for the improvement and creation of safe working conditions, provided for by acts, orders and orders, lists of defects.

3.37 At meetings of engineering and technical workers of the unit, meetings of production personnel (site) or shifts, reports on the violations of safety rules during work, cleaning and repair of equipment.

3.38 In case of an emergency, he urgently organizes first aid to the victim and his delivery to the medical unit (clinic), immediately notifies the head of the production unit and the shift supervisor, keeps the situation at the workplace and the condition of the equipment as they were at the time of the incident does not threaten the life and health of employees, does not lead to an accident, does not violate the continuous production process in technology).

It takes measures to eliminate other incidents (fires, equipment malfunctions), taking into account the timeliness and correctness of the measures taken, and adjusting them. Informs the head of the site about this.

3.39 Train the newly adopted and transferred workers in safe working methods. Participates in the work of the commissions to check the knowledge of the unit for admission to independent work. Supervises the timely conduct of briefings, training, testing of knowledge of subordinate personnel.

3.40 Introduces proposals for the promotion of subordinate staff for observance of discipline and safe working methods, good maintenance and continuous use of protective equipment, safety devices and devices.

3.42 Organizes the development of surveys on accidents and information materials.

4 Rights

4.1 Supervises a group of locksmiths on the repair of the TME of the GBCS section.

4.2 Terminates the production of works and removes from repair personnel for violations of RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY.

4.3 Submits to the head of the GBCS section the materials on the encouragement or imposition of penalties on locksmiths on the repair of equipment.

4.4 Appeals the orders of the head of the GBCS section to the head of the CCGT unit. Do not suspend its execution until a final decision has been made by the management of the unit.

4.5 In case of disagreement with the received order, the repair master of the TME of the site of the GBCS of the CCGT unit declares this, but after receiving the confirmation, it performs it, if this does not threaten the safety of the personnel

or the safety of the equipment. To verify the correctness of the understanding of the received order, he repeatedly replies to his person who gave this order.

5 Relationships

5.1 Fulfills all administrative and technical orders of the head of the GBCS section and the deputy head of repair of the CCGT unit.

5.2 In case of receiving an order from the chief engineer or the director, executes it and brings it to the attention of the deputy head of the unit of the CCGT of the GBCS section.

5.3 Gives orders and instructions to the repair and operational personnel of the GBCS site, receives from them reports of all malfunctions and defects in the operation of the equipment plots, takes measures to eliminate them, recruiting repair personnel at the GBCS section of the CCGT unit, CRU and contractors.

5.4 Coordinates the issues of repairing equipment with the masters of the CRU, the electric unit, the TAI unit, contractors, resolving the issues of disagreement through the deputy head of the unit of the CCGTs on repair.

5.5 In telephone conversations, he names his name and position, and then transmits or receives an order or message.

5.6 The orders of the repairman for the thermal mechanical equipment of the GBCS section of the CCGT unit can be canceled by the head of the GBCS section.

6 Responsibility

6.1. The repairman for the TME of the GBCS section of the CCGT unit should comply with the requirements of the current legislation in the activities of subordinated personnel.

6.2. The repairman for the TME of the GBCS section of the CCGT unit is involved in disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic Uzbekistan.

Developed by The CCGT unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

E. E. Davov

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

The Legal Advisor

Sh. Nazarov

Responsible for Standardization

N.S. Nurullaeva

KSt 202-831:2015

COMPANY STANDARD

**JOB DESCRIPTION OF DUTY LOCKSMITH(MECHANIC) OF GAS
BOOSTING COMPRESSOR STATION OF CCPP UNIT**

STOCK COMPANY SC «NTPP»

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED BY The CCGT UNIT of JSC " NTPP "
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INSTEAD OF KSt 202-838:2012

Approved

Production director

SC « NTPP »

T. G. Nazarov

COMPANY STANDARD

JOB DESCRIPTION OF DUTY LOCKSMITH OF GAS BOOSTING COMPRESSOR STATION OF CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined cycle steam and gas turbine plants", the Unified tariff and qualification directory of works and occupations of workers, in order to regulate the functions, duties, rights and responsibilities of the duty locksmith at the GBCS unit of the CCGT unit, and is mandatory for him.

The instruction should be known by: the duty locksmith of the GBCS section, the senior operator of the GBCS section, the operators and the patrol-operators of the compressor unit.

2 General terms

2.1 The main task of the on-duty locksmith is the repair maintenance of thermal mechanical equipment in the section of GBCS. Monitoring the operation of the equipment of the service site.

2.2 Persons who are not younger than 18 years old and have secondary specialized education, who have undergone medical examination, knowledge testing, internship (duplication) are appointed to the position of the on-duty locksmith at the GBCS site, in accordance with the "Rules for the organization of work with personnel at energy production enterprises" by the registered Ministry of Justice of the Republic of Uzbekistan dated 04.10.2002 N 1178.

2.3 The duty locksmith of the GBCS site is appointed, moved and dismissed by the order of the general director of the power station on the proposal of the head of the GBCS section, the head of the CCGT unit and the personnel department, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The duty locksmith of the GBCS section administratively and technically obeys the master of the GBCS section, and in the operational senior operator of the CCGT and the operator of the GBCS compressor unit.

2.5 The responsibility for the preparation of the workplace for the on-duty locksmith and the admitting is the senior operator of the CCGT unit.

2.6 The duty locksmith of the GBCS site should know and be guided in his work:

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011 in the following volume:

Section I Chapter 1 § 1-7, 12-16;

Section II Chapter 1;

Chapter 3 § 1 paras. 173-190, paras. 201-218

§ 9, 13;

Chapter 4§2, 12, 14;

Chapter 5§ 5-6.

- "Safety rules for the operation of thermal mechanical equipment of the power plant of heating networks", Tashkent 2012 in the following volume:

Chapter I;

Chapter II;

Chapter III;

Chapter VI § 2B;

Annexes 2, 3, 4, 5, 6, 7, 16.

- "Safety rules in the gas economy of the Republic Uzbekistan, Tashkent 2004, in the following volume:

Chapter I§ 1,2,3,4;

Chapter VI;

Appendices 31.

- "Safety rules when working with tools and devices";

- "Fire safety rules for energy companies", Tashkent 213;

- KSt 202-036-2007 "Rules of internal labor regulations of employees of JSC "NTPP";

- RH 34-304-258: 2010 "Typical instructions. Contents and application of primary fire extinguishing means at electric power facilities ";

- "Instructions for first aid for victims in connection with accidents in the maintenance of power equipment";

- Job description.

2.7 The on-duty locksmith of the GBCS site should know:

- The device, operation and main operational characteristics of the compressor plant, fittings, filter-separators and technology of their repair;
- Operational instructions and flow diagrams of the compressor station;
- Territorial location of the main and auxiliary equipment.

2.8 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in case of violation of rules and instructions, at the request of the state supervision bodies, the State Energy Inspectorate, higher management bodies as decided by the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoatgeotehnazorat" - once a year.

2.9 The workplace of the on-duty locksmith at the GBCS site is located in the operator's building of the CCGT.

2.10. The service zone of the duty locksmith at the GBCS site is the entire territory where the GBCS equipment is located.

3 Responsibilities

3.1 To monitor the timely tightening of the oil seals of pumps and accessories of the compressor plant, as well as the quality stuffing of the stuffing boxes on the

valves and pumps that have been put out for repair and replacement fingers on the couplings of pumps.

3.2 Clean ABO pipe system, oil coolers, separator filters, gas heaters disconnected for repair.

3.3 Troubleshoot the operation of the equipment.

3.4 Maintain control over the parameters of the compressor plant during start-up stops.

3.5 Eliminate leaks of air, oil and nitrogen by order of the senior operator or compressor operator.

3.6 Participate in start-ups, equipment breakdowns, in the elimination of emergency situations.

3.7 Reception and delivery of the shift in accordance with the Rules for the technical operation of power plants and networks.

3.8 Inspection of the equipment during the shift.

3.8.1 When taking a shift, the on-duty locksmith must:

- receive information from the person who takes the shift about the equipment, which must be carefully monitored to prevent violations in the work;
- check and accept from the person who gives the shift tool, materials, (stuffing box packing, lubricant, keys, workplace documentation);
- report to the senior operator about entering into duty and

The shortcomings revealed during the acceptance of the shift.

- acceptance and delivery of the shift during the liquidation of the accident is **FORBIDDEN**.
- in the event of an emergency situation, the on-duty locksmith who comes on the job is used at the discretion of the person guiding the liquidation of the accident;
- leaving from duty without changing the shift is **PROHIBITED**.

3.9 Extinguishing fires and fires on equipment senior operator of the power unit of the CCGT unit.

3.10 Increase technical knowledge, participate in production and economic studies.

3.11 Maintain the complete tool and tools in serviceability.

3.12 Keep your workplace clean.

3.13 In case of emergency, immediately arrange first aid to the victim and deliver him to the medical unit (medical center), immediately inform the site manager and the shift supervisor, keeping the situation at the workplace and the condition of the equipment as they were at the time of the incident threatens life and health of employees, will not lead to an accident, it will not break the continuous production process in technology).

4 Rights

4.1 Require the senior operator of the GBCS site to repair equipment in order to eliminate defects.

4.2 Require the administration of the unit to provide on-duty locksmiths with the necessary tools, consumables, and protective equipment in accordance with the requirements of RULES OF SAFETY TECHNIQUE.

4.3 Do not comply with orders that conflict with Rules of technical operation, RULES OF SAFETY TECHNIQUE or pose a threat to the safety of people or the safety of equipment.

4.4 Appeal in case of disagreement other orders not suspending their execution.

5 Relationships

5.1 Carries out all orders of the higher shift personnel, stipulated by the duties of the duty locksmith, in accordance with this job description.

If disagreement is received by the order, the duty locksmith of the site, the GBCS must state this to the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

5.2 In case of receiving an order directly from the general director, production director or other administrative person of the power plant, it executes it and informs the operator of the GBCS or the senior operator of the CCGT unit.

5.3 In operational telephone conversations with personnel, he first of all names his position and surname, and then receives an order or a message.

5.4 Disagreements that do not find a common solution may be resolved by the "Labor Disputes Commission".

6 Responsibility

6.2 The duty locksmith of the GBCS site is involved in disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing his or her functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Developed

The CCGT unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agree

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of the department

E. E. Davova

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Legal adviser

Sh. Y. Nazarov

Responsible for Standardization

N.S. Nurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF THE DEPUTY HEAD ON REPAIR OF CCPP
UNIT**

STOCK COMPANY SC «NTPP»

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCPP unit of JSC "NTPP"
- 2 APPROVED AND RUN IN BY the order of SC « NTPP » №
- 3 INSTEAD OF KSt 202-813:2012

Approved

SC « NTPP » Director

K. Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF THE DEPUTY HEAD ON REPAIR OF CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined-cycle combined cycle gas turbine plants", the Qualification Reference Book for the positions of managers, specialists and employees in 1987, for the purpose of regulating the functions, duties, rights and responsibilities of the deputy head of the combined-cycle gas turbine plants (CCPP) and is mandatory for him.

2 General provisions

2.1 The deputy head for repair of the equipment at the CCGT unit is responsible for organizing the timely production of repair of equipment assigned to the CCGT unit, for ensuring the equipment is ready for carrying electrical and thermal loads with a high degree of reliability and economy.

2.2 The deputy head of the unit of the CCGT for repair must have higher technical education and work experience in engineering and technical positions for at least 3 years or secondary special and work experience in engineering and technical positions for at least 5 years.

2.3 The deputy head of the unit of the CCGT for repair is appointed, moved and is relieved of his post by the order of the director of the station at the request of the personnel department and the unit manager of the CCGT, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The deputy head of the unit for repair of the equipment of the CCGT unit in the production, technical and administrative respect submits to the head of the CCGT unit.

2.5 All repair engineers of the CCGT unit are subordinate to the deputy head of repair.

2.6 In the absence of the head of the unit and the deputy head for repair is replaced by the deputy head of the unit of the CCGT for operation.

2.7 In the absence of the head of the unit and the deputy head on operation is replaced by the deputy head of the unit of the CCGT CC for repair.

2.8 In the course of its activities, the Deputy Head of repair manages the entire repair team through the leading engineers of the CCGT unit.

2.9 Deputy Head of the unit of the CCGT for repair of equipment should know and be guided in their work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 of 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2011:

Section I Chapter I. § 1-16;

Section II Chapter 2. § 4;

Chapter 3. § 1, 3, 4, 5, 7, 8, 9, 11, 12, 13;

Chapter 4 § 1, 2, 12, 13, 14;

Chapter 5 § 1-6;

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", Tashkent 2012 in the following volume:

Chapter I.

Chapter 2 § 1, 2;

Chapter 3 § 1-6, 9-14;

Chapter 4 § 2, 3, 4, 6, 8, 9.

Appendix: 2-8, 10, 11, 13-17, 19

- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004 in the following volume:

Chapter I. General provisions. § 15;

Chapter III. Operation of gas facilities § 1, 2, 3, 4, 7;

Chapter VI. Gas hazardous work;

Applications - 19, 20, 30, 31, 32.

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Pipelines", 2010 in the amount of:

Chapter 1 General Provisions

Chapter 2 Designing

Chapter 3 Materials and semi-finished products

Chapter 4 Manufacturing, installation and repair

Chapter 5 Registration, technical survey, permit for operation

Chapter 6 Organization of Safe Operation and Repairs Chapter 8 Painting and Inscriptions on Pipelines

Chapter 9 Safety Signs

Chapter 10 Accident and accident control

Chapter 11 Compliance

Appendices 1-10;

- "Rules for the Arrangement and Safe Operation of Steam and Hot Water Boilers", Tashkent 1997 in the following scope:

Section 1.;

Section 2;

Section 3. 3.1 - 3.6;

Section 4. 4.1 - 4.7; 4.10;

Section 5. 5.1;

Section 6.

Section 7. 7.1-7.4;

Section 8;

Section 9;

Section 10;

Appendices 1, 2, 3, 4, 6.

- "Safety rules when working with tools and attachments";

- "Fire safety rules for energy companies", Tashkent 2013;

- RH 34-400: 2008 "Regulations on the Occupational Safety Management System in the Energy Industry;

- RH 34-304-258: 2010 "Typical instructions. Contents and application of primary fire extinguishing means at electric power facilities ";

- "Explosion safety rules when using fuel oil and natural gas in boiler plants";

- The present job description, the Regulations on the CCGT unit of the job descriptions and production instructions of all subordinate personnel;

- KSt 202-036-2007 "Rules of internal labor regulations for employees of JSC" NTPP ";
- "Instructions for the investigation and recording of fires that occurred at energy facilities";
- RH 34-077: 2008 "Rules for the organization of maintenance and repair of power plant equipment";
- Orders and orders of JSC "NTPP";
- Directive materials of SJSC "Uzbekenergo", operational and emergency circulars;
- "Rules of organization of work with personnel at energy production enterprises", registered by the Ministry of Justice RUz from 04.10.2002 N 1178;
- "Instructions for first aid to victims in connection with accidents while servicing power equipment";
- Labor Code of the Republic of Uzbekistan, Tashkent, 1996;
- RH 34-301-800: 2006 "Typical instructions. Control and prolongation of the service life of metal of the equipment of thermal power plants ";
- Guidance documents for the production of repair work;
- Design and operational characteristics of the main and auxiliary equipment, technological diagrams of the equipment of the CCGT unit, location of fire extinguishing means and water supply system, location of equipment, pipelines, fittings; rules and norms of labor, safety precautions, industrial sanitation, fire protection; the fundamentals of labor law; daily, monthly, quarterly and annual technical and economic indicators and targets for them;
- Existing GOSTs, SSBT, KMK with reference to activities.

2.10 Testing of knowledge of Rules of technical operation, Rules of safety technique, Rules of fire safety, job descriptions and production instructions should be carried out:

- primary - before admission to independent work,
- Periodic - on time,
- extraordinary - in case of violation of rules and instructions, on demand bodies of State Supervision, State Energy Inspectorate, higher management bodies, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, Rules of fire safety, production and job descriptions should be made at least once every 3 years.

The periodicity of checking Rules of safety technique knowledge, the rules of the device and the maintenance of equipment controlled by the Agency "Sanoat-Geocontekhnazorat "- once a year.

Initial certification is carried out after 1 year of work in the of this position; The following attestations are conducted according to the results of past, but not less than 1 time in 5 years.

2.11 The location of the deputy head of the unit of the CCGT for repair of the equipment of the CCGT unit is located in the service room of the CCGT unit.

2.12 The repair service area is all the equipment of the CCGT unit at all heights: HRSG, steam and gas turbines of the CCGT, the gas compression compressor station and gas pipelines to the main gas valves of the gas supply station, the reserve condensate tank, the main pipelines of the heating network , a boiler with pumps.

3 Functions and responsibilities

3.1 Timely preparation and quality repairs and maintenance of the equipment at the CCGT unit.

3.2 Increasing the efficiency, repair production of the unit, the station.

3.3. Implementation of instructions (orders) of the unit manager of the CCGT on production and economic activities of the unit.

3.4 Bring production tasks, work plans to the masters, and organize their implementation.

3.5 To promote the development of rationalization, invention, to organize the introduction of adopted proposals.

3.6 Timely organization of scheduling, including network schedules, organization of work on planned, emergency repairs.

3.7 Participate in the acceptance of equipment from capital, medium, current repairs and testing after equipment repairs.

3.8 Coordinate the work of contractors, employed in repairing the equipment of the CCGT unit, organize acceptance of the repaired equipment by contractors with the preparation and maintenance of the relevant documentation for the work performed; to control volumes, quality, terms of performance and progress of repair work.

3.9 To organize the inspection of the technical condition and the defectiveness of the equipment being removed for repair.

3.10 Control the registration of technical documentation for the equipment being repaired, the receipt and storage of the accounting documentation on repair work performed by contractors.

3.11 Participate in the technical survey of facilities registered with the local bodies of Sanoat-geocontehnazorat ".

3.12 Ensure the implementation of approved measures, those decisions for the reconstruction, modernization of equipment.

3.13 Draw up claims for spare parts and materials, and protect them in OPR and OMTC.

3.14 Maintain systematic monitoring of technical condition repaired equipment by patrol and acquaintance with the records in the fault logs, give appropriate instructions to the sections of the Central Repair Unit regarding the nature of the defects, the timing of their implementation and the order of priority.

3.15 Take into account, systematize all the problems, defects, simple equipment, study the causes of their occurrence; carry out measures to reduce them.

3.16 Organize subordinate staff training and implement quality control of training.

3.17 Ensure safe working conditions during operation, repair, maintenance of equipment.

3.18 Every day, get acquainted with the entries in the state of safety and industrial sanitation; to ensure the elimination of shortcomings by the personnel of the unit of the CCGT or CRU of station.

3.19 Require the masters of the report at the beginning of the day on the state of safety engineering, means of protection and violations of Rules of safety technique, norms and safe methods of work.

3.20. Provides the subordinate personnel with magazines, instructions, signs, safety posters, controls their safety; condition and equipment of the corners of Safety technique, Safety rules literature, manuals.

3.21 Supervises the observance of labor and production discipline, the implementation of instructions, regimes, Rules of safety technique, industrial sanitary, immediately suppresses their violation.

3.22 Daily checks the status of workplaces, tools, means of protection, takes measures to eliminate violations.

3.23 Daily checks the preparation of jobs (selectively).

3.24 Organizes the provision of individual workers protection with preventive devices, drinking water.

3.25 Controls the correctness of filling and issuing orders for the production of works.

3.26 Ensures compliance with prescribed requirements according to the Rules of safety technique, provided by the acts, orders, etc ..

3.27 Prepares proposals for a prospective comprehensive plan, makes ready plan of measures for the protection of labor and safety equipment, industrial sanitary, reducing the incidence of disease in the repair group of the unit.

3.28 Ensure timely management of all types of training instructing, testing the knowledge of the personnel.

He enters the commission to check the knowledge of workers, issues orders and permits for independent work..

4 Rights

4.1 Obtain from the unit manager of the CCGT and other engineering and technical employees and structural units of JSC "NTPP" documents and information necessary for the performance of their duties.

4.2 To give instructions to the unit masters of the CCGT for questions of production and economic activities, to require timely and high-quality implementation.

4.3 Participate in disassembling and discussing work plans and in summarizing the unit of the CCGT.

4.4 To issue spare parts, materials, tools, equipment, overalls, etc. from the warehouses of JSC "NTPP" in accordance with the established procedure.

4.5 To monitor and demand from the staff of the CCGT unit of the timely preparation of equipment for repair.

4.6 Suspend work in the event of a violation Rules of technical operation, Rules of fire safety, Rules of safety technique, production technology and other violations that could lead to injury to personnel, the violation of production technology or breakdown of equipment.

4.7 To head the tariff-qualification commission when checking the knowledge of personnel.

4.8 Make suggestions to the unit manager of the CCGT and develop measures aimed at the fulfillment of the main tasks of the CCGT unit on improvement of working conditions, technical and economic indicators of the unit, the station.

4.9 Make suggestions to the head of the CCGT CC on encouraging, punishing, depriving or reducing the premium to staff for production omissions or violations; on the training and placement of personnel; on the admission, transfer or dismissal of subordinate personnel; on the timing or order and labor leaves to the workers of the unit.

5 Relationships

5.1 Performs all administrative and technical orders of the head of unit of CCPP.

5.2 In case of disagreement with the received order, declares this, upon confirmation of the order, fulfills it, if this does not threaten the safety of personnel, the preservation of equipment.

To verify the correctness of the received order, he must repeat it to the person who issued the order.

5.3 If you receive an order from the director or chief engineer of the station performs it and brings this to the attention of the head of the CCGT unit.

5.4 Through the masters of the CCGT unit receives information and gives instructions to the operative and repair personnel regarding the withdrawal to repair, the commissioning after repair of the equipment of the CCGT unit, receives information from the masters about all the failures and defects in the equipment of the CCGT unit and takes measures to eliminate them.

5.5. Coordinates issues and documents for repair of equipment with the management of the Central Repair Unit, the electrical unit, CTAI, contractors, resolving the disagreements through the Deputy Chief Engineer for the repair of equipment of JSC "NTPP" and the unit manager of the CCGT.

5.6 At telephone conversations first of all says the surname and a post, and then transfers or receives the order or the message.

5.7 Orders of the deputy head of repair can be canceled by the unit manager of the CCGT.

6 Responsibility

6.1 The Deputy Head of Repair must comply with the requirements of the current legislation in the activities of subordinate personnel.

6.2 The Deputy Head of Repair is involved in disciplinary, administrative and other measures of responsibility for failure to perform or improper performance of their functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan

Information data

Designed by the CCPP Unit of JSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of the department

T.K. Soliev

Planning and Economic Department

Head of department

EE. Davova

Service reliability of machinery and industrial safety

Head of Service

Kh. O. Muminov

Legal adviser

Sh. Y. Nazarov

Responsible for Standardization

N.S. Nurullaeva

KSt 202- 813:2015

STANDARD OF THE ENTERPRISE

**JOB INSTRUCTION
OF THE FOREMAN ON REPAIR OF HEAT MECHANICS EQUIPMENT OF THE
THE WORKSHOP OF THE COMBINED CYCLE GAS TURBINES**

**Open Joint Stock Company NTPS
Navoi**

Foreword

1. ELABORATED AND SUBMITTED by the Workshop of the Combined Cycle Gas Turbines of the Open Joint Stock Company NTPS
2. APPROVED AND ENFORCED by the Order of the Open JSC NTPS dated 27.04.2012 No. 221
3. INTRODUCED FOR THE FIRST TIME

STANDARD OF THE ENTERPRISE

JOB INSTRUCTION
OF THE FOREMAN ON REPAIR OF HEAT MECHANICS EQUIPMENT OF THE
THE WORKSHOP OF THE COMBINED CYCLE GAS TURBINES

Validity period from 01.05.2012 to 01.05.2015

1. Field of application

The present Instruction is elaborated on the basis of the KSt 202-810:2011 “Regulations on the workshop of the combined cycle gas turbines”, Qualification reference book of the positions of the heads, specialists and employees 1987 for the purposes of regulation of the functions, obligations, rights and responsibilities of the foreman on repair of heat mechanics equipment of the workshop of combined cycle gas turbines (CCGT) and is obligatory for him.

2. General Provisions

2.1. Foreman on repair of heat mechanics equipment of the CCGT workshop ensures readiness of the equipment for bearing thermal and electric loads at high level reliability and economy.

2.2. Foreman on repair of heat mechanics equipment of the CCGT workshop shall have higher technical education and years in service in the production not less than 1 year or secondary specialized education and years in service not less than 3 years.

In case of no specialized education years in service shall be not less than 5 years.

2.3. Foreman on repair of heat mechanics equipment of the CCGT workshop is assigned to his position, transferred to other position and dismissed from the position by the order of the Director of the power plant upon proposal of the Head of the CCGT workshop and Human Resource Department, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4. Foreman on repair of heat mechanics equipment of the CCGT workshop from administrative point of view is subordinated to the Head of the CCGT workshop while in production and technical aspects to the deputy head of the CCGT workshop on repair.

2.5. Foreman on repair of heat mechanics equipment of the CCGT workshop in production and technical aspects has subordinated team of the metalworkers and cleaning ladies for the production premises of the CCGT workshop.

2.6. Foreman on repair of heat mechanics equipment of the CCGT workshop shall be aware and follow in performing his duties the followings:

- "Rules of technical operation of the power stations and networks of the Republic of Uzbekistan",

Tashkent 2005 in the following scope:

Section I	Chapter 1	§ 1-16;
Section II	Chapter 1	§ 1, 2;
	Chapter 2	§ 4;
	Chapter 3	§ 1, 3, 4, 5, 7, 8, 9, 11, 12, 13;
	Chapter 4	§ 1, 2, 12, 14;
	Chapter 5	§ 1-8;

- "Rules of Safety measures in operation of the heat mechanics equipment of the power stations and heating networks" in the following scope:

Section 1;	
Section 2.	Subsections 2.1-2.11;
Section 3.	Subsection 3.1 – "A" clauses 3.1.1.; 3.1.4.; 3.1.14; 3.1.16; 3.1.18;
	Subsection 3.2 – "C", "E";
	Subsection 3.3 – "A";

Annexes 1-12.

- "Rules on fire safety for the power enterprises", Tashkent 2004;

- "Safety Rules in the gas sector of the Republic of Uzbekistan", Tashkent 2004, in the following scope:

Chapter I	§ 1; § 2 Clause 4
Chapter III	§ 1, 2, 3, 4,7;
Chapter V;	
Annexes 1, 2, 19, 30, 31, 32.	

- "Rules of the Installation and safe operation of the vessels operating under pressure": Tashkent 1990 in the following scope:

Section 1	Subsections	1.1.; 1.2.;
Section 2	Subsection	2.1. Clauses 2.1.1, 2.1.2;
	Subsection	2.4. Clause 2.4.6;
Section 5	Subsections	5.1.-5.6.;
Section 6;	Subsections	6.2.-6.4.;
Section 7;	Subsections	7.1.-7.4.

- "Rules of design and safe operation of the pipelines of steam and hot water", 1992 in the following scope:

Section 1	Subsections	1.1.; 1.2.;
Section 4	Subsection	4.5;
Section 5	Subsections	5.1.-5.4.;
Section 6.		

- Instruction RR-56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated 12.01.1999 No. 140 "On the measures aimed on strengthening the operational discipline"

- Law of the Republic of Uzbekistan "On Electric power" No. 225 dated 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated 22.08.2009 “On Approval of the rules of using the electric and heat power”;
- “Rules of design and safe operation of the steam and water heating boiler”, Tashkent, 1997;
- “Safety Rules in working with the instruments and devises”;
- “Instruction on the fire safety measures in performing fire related works at the power facilities”;
- “Rules of explosion safety in using the gas, mazut in the boiler units”;
- the present Job Instruction, “Regulations on the workshop of CCGT”, Job instructions and Industrial Instructions of all subordinated personnel;
- KSt 202-036: 2007 “Rules of internal labor policy of the workers of the Open Joint Stock Company NTPS”;
- RH 34-304-258:2010 “Model Instruction. Content and application of the primary means of fire extinguishing at the power sector facilities”;
- “Instructions on investigation and accounting of the fires, occurring at the power sector facilities”;
- “Regulations on investigation and recording the occupational accidents and other damages to the health of the personnel”, approved by the Cabinet of Ministers dated June 6, 1997;
- Orders and Instructions of the Open Joints Stock Company NTPS;
- Directive materials of the State Joint Stock Company “Uzbekenergo”, operational and emergency prevention instructions, emergency prevention orders and etc.;
- “Rules of organization of the work with the personnel at the enterprises of the power sector”, registered by the Ministry of Justice of the Republic of Uzbekistan dated 04.10.2012 No. 1178.
- KSt 202 – 038 : 2007 “Regulations on bonus payment of the workers, heads, specialists and other workers of the power station for the main results of the economic activity”;
- Labor Code of the Republic of Uzbekistan. Tashkent, 1996;
- RH 34-301-800:2006 “Model Instruction. Control and extension of the service life of metal of the equipment of thermal power stations”;
- “Model Instruction on control and extension of the service life of metal of the main elements of the boilers, turbines and pipelines of the thermal power stations”;
- “Instructions on rendering first aid to the injured persons in connection with the accidents in the process of servicing the energy equipment”;
- Rules and norms of the labor safety, safety measures, production sanitary and fire protection.

2.7. Examination on the knowledge of the Operation Rules, Safety Rules, Fire Safety, job instructions and industrial instructions shall be carried out as follows:

- initial – before granting the permission to the independent operation;
- periodical – within the set periods;
- unscheduled – in case of violation of the rules and instructions, upon the request of the bodies of the State Control, State Energy Inspection, higher bodies of management in accordance with the decision of the special commission.

Periodical examination for the knowledge of the Operation Rules, Fire Safety Rules, industrial and job instructions shall be carried out not less than once in 1 year.

2.7. Foreman on repair of heat mechanics equipment of the CCGT workshop shall know followings:

2.7.1. Design, specifics of operation and operational specifications of the main and auxiliary equipment of the CCGT workshop.

2.7.2. Manufacturing scheme of the equipment.

2.7.3. Location of the fire extinguishing means and the system of water supply of the CCGT workshop.

2.7.4. Daily, monthly, quarterly and annual technical and economic indicators and planned assignments on them.

2.7.5. Territorial location of the equipment (main equipment, pipelines, drums, heaters, coolers and etc.).

2.8. Examination on the knowledge of the technical operation rules, safety rules, fire safety, job instructions and industrial instructions shall be carried out as follows:

- initial – before granting the permission to the independent operation;
- periodical – within the set periods;
- unscheduled – in case of violation of the rules and instructions, upon the request of the bodies of the State Control, State Energy Inspection, higher bodies of management in accordance with the decision of the special commission.

Periodical examination for the knowledge of the technical operation rules, fire safety rules, industrial and job instructions shall be carried out not later than once in 3 years.

Periodicity of the examination of the knowledge of the safety measures, rules of design and safe operation of the equipment, supervised by the State Inspection “Sanoatgeokontehnazorat” is once a year.

2.9. Primary attestation shall be carried out after passing 1 year of working in the present position; subsequent attestations shall be carried out on the basis of the results of the previous attestation, but not later than once in 5 years.

2.10. Working place of the foreman on repair of the heat mechanics equipment of the CCGT workshop is in the service room of the CCGT workshop.

2.11. Servicing zone is the equipment of the CCGT workshop.

3. Functions and duties

3.1. Takes part in compiling the annual schedules of the repair of the equipment, as well as in the program of before repair and after repair works.

3.2. Takes part in compiling the annual applications for the materials, spare parts on reconstruction and technical re-equipment.

3.3. Controls complete filling the bulletins of the volumes of the works for overall, current and emergency repairs.

3.4. Controls completeness of the volumes and quality of the repair works, takes part in the acceptance of the equipment.

3.5. Performs control of maintaining repair documentation (passport, forms) of the main and auxiliary equipment.

3.6. Determines the possibility and necessity of the repair of the auxiliary equipment, coordinates the volume of the repair with the Central Repair Workshop, performs control over the fulfillment of the organizational and technical activities on the de-commissioning of the equipment to repair.

3.7. Carries out introduction of the activities on raising the fire safety level of the equipment of the CCGT workshop.

3.8. Takes part in compiling the monthly plans of the works for the Central Repair Workshop and contractor organizations.

3.9. Organizes readiness of the equipment of the CCGT workshop for conducting technical certification by the Inspectors of the Sanoatgeokontehnazorat and commission of the power plant.

3.10. Performs control over operative elimination of the defects in the operation of the equipment of the CCGT workshop in accordance with the journal of defects.

3.11. Performs periodical supervision over the observation of the rules of safety measures by the personnel of the Central Repair Workshop and by the contractor organizations with applying measures towards the violators.

3.12. Carries out regular inspections of the equipment of the CCGT workshop.

3.13. Organizes and examines the work of the personnel of the repair team of the CCGT workshop in accordance with the Rules of organization of the work with the personnel at the enterprises of power generation.

3.14. Ensures fulfillment by the subordinated personnel within the established timeframes planned tasks, raising the productivity of the labor, rational spending of the materials, fuel, power, normalizes their work and compiles report for the month.

3.15. Organizes introduction of the advanced methods and ways of the labor, combination of the professions, attestation and rationalization of the working places and other elements of the scientific organization of the labor.

Ensures fulfilling by the workers the norms of the output, correct usage of the organizational and technical activities, correct usage of the organizational technical equipment and facilities (fittings and equipment).

3.16. Performs production briefing to the workers, carries out activities on fulfilling the labor safety rules, safety measures and production sanitary, technical operation of the equipment, tools, as well as control over their observation.

3.17. Facilitates application of the modern forms of organization of the labor, submits proposals on assigning the qualification categories to the workers, takes part in the tariffing works and assigning the qualification categories to the workers of the daytime shift team.

3.18. Analyses the results of the production activity:

- controls the spending of the payroll fund established to the team;
- ensures correctness and timely filling the primary documents on accounting the working hours.

3.19. Facilitates dissemination of the advanced experience, initiatives, development of the creative plans, introduction of rationalization proposals and inventions.

3.20. Ensures timely revision of the norms of labor expenses in accordance with the established procedures, introduction of the technically grounded norms and standardized assignments.

Takes part in implementation of the works on revealing the reserves of production, elaboration of the activities on creation of the favorable labor conditions, raising the production culture, rational usage of the working hours.

3.21. Ensures observation by the workers the requirements of the rules and instructions of the safety measures and application of the safe methods in production of the works.

3.22. On daily basis carries out examination of the operability and correct operation of the equipment, mechanisms.

Takes measures on elimination of the revealed shortcomings.

In cases, when malfunctions in the operation of the equipment cannot be eliminated and there is an obvious danger for the workers, PROHIBITES performing works by the personnel and notifies about this the management of the workshop.

3.23. Organizes planned-prophylactic repair of the equipment, which ensures its safe operation.

3.24. Receives (issues) orders-permits and instructions for performing the works, which require their issuance and is not allowed to perform these works without obtaining the necessary permits.

3.25. Carries out periodical and unscheduled briefings, briefings at the work places on safe methods of the labor with registering them in the journal of briefings, order-permits.

3.26. Before commencement of the works, examines compliance with the requirements of the safety of the instrument, means of protection, scaffoldings, bridge floors, other devises, designed for carrying out repairs.

PROHIBITES their usage until hidden shortcomings are eliminated.

3.27. Ensures availability on the equipment and on corresponding disconnected devises the warning posters informing about carrying out repair works, as well as fences and other means of the safety measures.

3.28. Performs continuous control and direct supervision of the works or execution of its certain stages in cases, provided by the rules of safety measures.

3.29. On the daily basis, in the beginning of the working day, jointly with the public inspector on labor safety, in the form of the control of stage one, examines compliance by the personnel the rules of safety measures, application of the special protective clothes and footwear, necessary devises, violations, revealed in the time of previous examination.

In case of misconduct by the particular workers in observation of the safe methods of labor, removes them from the work and submits proposal on imposing penalty, as well as carries out unscheduled briefing on the safety measures.

3.30. Ensures cleanness and order at the working places, in passages, and access roads, as well as sufficient lighting of the working places, correct maintenance of the crane ways with systematical (daily) examination of the labor conditions of the workers.

Takes measures for elimination of the revealed shortcomings.

3.31. Control observation of the norms of carrying out weights, including by the women and teenagers.

3.32. Equips the working places with the safety signs, warning notices and posters.

3.33. Takes measures against possible presence of the outsiders at the area of working section, in production premises and at the working places.

3.34. Daily checks records in the journal on the conditions of the equipment, violation of the safety rules and production sanitary, endorses them, determines the measures and gives assignments for the elimination of the defects, malfunctions and violations.

3.35. Reveals the reasons of the violations of the rules of safety measures in performing the works, reviews them together with the personnel and determines the measures on preventing their occurrence in the future.

3.36. Participates in elaboration of the job instructions for the workers, instructions on safety measures and labor safety.

3.37. Ensures fulfilling the within the established timeframes instructions and activities on improvement and creation of safe labor conditions, provided by the acts, orders and instructions, bulletins of the defects.

3.38. At the meetings of the engineering and technical personnel of the workshop, meetings of the production personnel (section) or shifts, reports on the violations which took place in the process of operation, cleaning and repair of the equipment.

3.39. In case of accident immediately organizes first aid to the injured person and arranges his delivery to the medical center, immediately reports to the head of the workshop and head of the shift, preserves till the investigation the surrounding at the working place and conditions of the equipment, in the same conditions, as they were at the moment of accident (unless it threatens to the life and health of the workers, leads to emergency, violates continuous production process in accordance with the technologies).

Undertakes measures aimed on liquidation of other occurred accidents (fire, failure of equipment) taking into account at the same time timeliness and correctness of the undertaken measures, makes corrections. Notifies it to the head of the workshop.

3.40. Carries out training of the newly accepted or transferred workers to the safe methods of labor.

Participates in the work of the commission on examination of the knowledge of the workers of the workshop for granting permit to the independent work.

Controls for timely carrying out briefing, training, examination of the knowledge of the subordinated personnel.

3.41. Submits proposals on stimulation of the subordinated personnel for compliance with the discipline and safe methods of labor, good maintenance and continuous application of the protection means, safety devices and tools, for active participation in rendering aid to the injured persons and prevention of the accidents.

4. Rights

4.1 Stops performance of works and removes from the works the personal subordinated to him in case of violation of the rules of safety measures, rules of fire safety.

4.2. Submits to the deputy head of CCGT workshop on repair materials and stimulation or imposing penalties to the metalworkers on repair of heat and mechanics equipment and cleaning ladies of the production premises.

4.3. Lodges complaint against the instruction of the deputy head of CCGT workshop on repair to the head of the CCGT workshop without stopping its fulfillment until getting final decision by the side of the management of the workshop.

4.4. In case of disagreement with the received instruction foreman on repair of heat and mechanics equipment of the CCGT workshop reports about it, however after receiving confirmation fulfills it, unless it threatens to the safety of the personnel or safety of the equipment. For the purposes of verification of correct understanding of the received instruction obligatorily repeats instruction to the person who gave this instruction.

5. Interactions

5.1. Performs all administrative and technical orders of the head of the CCGT workshop and deputy head on repair.

5.2. In case of receiving the order from the chief engineer or director fulfills it and notifies the deputy head of the CCGT workshop and head of CCGT workshop.

5.3. Issues orders and instructions to the repair and operation personnel of CCGT, receives from them information on all malfunctions and defects in the operation of the equipment of CCGT workshop, undertakes measures aimed on their elimination, attracting repair personnel of the CCGT workshop, Central Repair Workshop and contractor organizations.

5.4. Coordinates the issues of repair of the equipment with the foremen of the centralized repair workshop, electric workshop, workshop of heat automatics and measurement, contractor organizations, resolving the occurred issues, disagreements through deputy head on repair of CCGT.

5.5. In telephone conversations first of all pronounces his surname and position, then shall transfer or receive order or message.

5.6. Orders of the foreman on repair of the heat and mechanics equipment of the CCGT workshop may be cancelled by the deputy head of the workshop on repair of CCGT.

6. Responsibility

6.1. Foreman on repair of the heat mechanics equipment of the CCGT workshop shall ensure compliance with the requirements of the legislation, currently in force in the operation of the subordinated personnel.

6.2. Foreman on repair of the heat mechanics equipment of the CCGT workshop shall bear disciplinary, administrative and other measures of responsibility for failing to fulfill or improper fulfillment of his functional duties, obligations, which lead to occurrence of the accidents and emergencies, damage of the property of the employer and other unfavorable consequences in accordance with the currently in force legislation of the Republic of Uzbekistan.

Information data

Elaborated by the Combined Cycle Gas Turbine Workshop of the Open joint Stock Company NTPS

Head of the workshop /signature/ I.H. Abdulloev

Coordinated with

Production and technical division

Head of the division /signature/ T.H. Soliev

Planning and economic division

Head of the division /signature/ K.M. Djumayeva

Service of the reliability of the equipment and industrial safety

Head of the division /signature/ H. O. Muminov

Legal Advisor /signature/ T.A. Toylokov

Staff responsible for standardization /signature/ O.L. Zelenskaya

KSt 202- 633:2006

COMPANY STANDARD

**JOB DESCRIPTION OF A METAL LABORATORY DEFECTOSCOPE
WORKER**

STOCK COMPANY SC « NTPP »

NAVOI

Introduction

- 1 DEVELOPED BY The metal laboratory
- 2 APPROVED AND RUN IN by the order SC «NTPP »
№478 dated 30.11.2006
- 3 FOR THE FIRST TIME

Approved
SC «NTPP » Director
B. I. Juraev

COMPANY STANDARD

**JOB DESCRIPTION OF A METAL LABORATORY DEFECTOSCOPE
WORKER (defectoscopeist)**

Term of validity from 01.12.2006 till 01.12.2009

1 Application area

This manual is developed based on KSt 202-626: 2006 "Regulations on the unit of metal laboratory of SJC Navoi TPP", the Qualification Reference Book for the positions of managers, employees' specialists in 1987, and is mandatory for defectoscopist of non-destructive methods of testing and supervision of metal.

2 General terms

2.1 Persons who are not younger than 18 years of age who have been specially trained and certified, which should be noted in the qualification certificate for the right to produce these works, are admitted to the position of the defectoscopist of the site of non-destructive methods of control and supervision of metal (hereinafter - defectoscopist).

2.2 Qualification requirements are determined in accordance with the "Qualifications directory of positions of managers, specialists and employees 1987".

2.3 The defectoscopist is appointed to the position, moved and dismissed by the order of the director of JSC "NTPP", on the proposal of the head of the laboratory, in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.4 The defectoscopist is administratively subordinated to the head of the metal laboratory, and in the productional-technical activity - to the engineer.

2.5 Planned tasks for the defectoscopist are established in accordance with the approved plans of the unit.

2.6 The defectoscopist must be guided in his work:

- The Law of the Republic of Uzbekistan "On Labor Protection"
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005.

Section I

Chapter I.

§ -1: p.p. from 1 to 13.

§ -3: p.p.31,33,43,45,46,47,48,51,52,53,54

§ -5: p.p.76,81,82,83,84

§ -6: p.p.85,86,87,87,89,90

§ -7: p.p.94,109

§ -8: p.p.117,119,120,121,122,124,126,128.

§ -13 whole.

§ -14 whole.

§ -15 p.p.236,238,239,240,241,242.

Section II

Chapter 3.

§ 9:p.p.434,435,436,437,442,446,448.

§ -13 whole.

-RD 34.03.201 91 "Rules Safety technique for the operation of thermal mechanical equipment of power plants and heating networks".

-legal documentation, instructions of the agency "Uzstandart", SJSC "Uzbekenergo";

- Orders, directions and instructions of the management of SJSC "Uzbekenergo" and the station;

-KSt 202-626:2006 "Regulations on metal laboratory"

- this manual.

2.7 The defectoscope is certified for compliance with the position in accordance with the established procedure, in accordance with the "Rules for the organization of work with personnel at energy production enterprises."

Approved by the order of the agency "Uzgosenergonadzor" from 10.09.2002 №433 passes the audit of knowledge of the Rules of Safety Technique once a year, according to the rules of technical operation, the Rules of fire safety, job descriptions and directives relevant to the competence of the unit - once in three years..

3 Function and Responsibilities

3.1 Directly performs visual, ultrasonic, magnetic particle testing, vortex control of metal, color flaw detection.

The defectoscopist (having the 2nd level of qualification) issues conclusions on the results of the control carried out.

3.2 Together with the operating personnel, he performs a visual inspection and inspection of the metal condition of the TPP equipment.

3.3 Participates in investigations of metal damage and the development of preventive measures.

3.4 Participates in drafting methodological instructions on issues within his competence.

4 Rights

- 4.1 To request verbally from the managers and specialists of the power system enterprises the necessary information on the condition and operating conditions of the metal of thermal mechanical equipment.
- 4.2 Require management of the unit to ensure working conditions that meet the standards of hygiene and industrial hygiene.
- 4.3 Appeal in the established manner the wrong actions and decisions in relation to themselves of the higher-level personnel of the laboratory.

5 Relationships

- 5.1 All relationships with other business units are carried out only through the management of the laboratory.

6 Responsibility

The defectoscopist is responsible in the prescribed manner for:

- 6.1 Quality of work performed on non-destructive testing of metal.
- 6.2 Timely issuance and reliability of conclusions based on the results of control.
- 6.3. Personal non-observance of Rules of technical operation, Rules of safety technique, Rules of fire safety, production discipline.
- 6.4 Material damage caused by his fault.
- 6.5 Failure to comply with the requirements of these instructions.
- 6.6 Safety of the equipment entrusted.

KSt 202-633: 2006

Informational data

Designed by metal laboratory

Head of laboratory

D. V. Davidenko

Agreed

Production and Technical Department

Head of the department

A.P. Nikolaev

Planning and Economic Department

Head of the Department

M.I.Zikriyaev

Reliability and safety service

Head of the service

I. M. Khamraev

Legal adviser

I.B. Norov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE CHEMICAL ENGINEER OF THE CCPP
UNIT**

STOCK COMPANY SC « NTPP »

NAVOI

Introduction

- 1 DEVELOPED AND ENTERED IN BY The CCGT UNIT OF OJSC "NTPP"
- 2 APPROVED AND RUN IN by the order SC « NTPP » №
- 3 INTRODUCED FOR THE FIRST TIME

Approved

SC « NTPP » Director

K. Kh. Ganiev

COMPANY STANDARD

JOB DESCRIPTION OF THE CHEMICAL ENGINEER OF THE CCPP UNIT

Term of validity from till

1 Application area

This manual is developed based on KSt 202-810: 2011 "Regulations on the unit of combined-cycle combined cycle gas turbine plants", the Qualification Reference Book for the positions of managers, specialists of employees 1987, for the purpose of regulating the functions, duties, rights and responsibilities of the chemical engineer of the combined cycle combined cycle gas turbine plants (CCGTs) and is mandatory for him.

2 General Terms

2.1 The chemical engineer of the CCGT unit must have a higher technical education and work experience in the chemical unit in engineering positions for at least 3 years.

2.2 The chemical engineer is appointed, moved and dismissed from the position by the director of the station upon presentation of the head of the unit of the CCGT, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3 The chemical engineer of the unit of the CCGT is administratively and technically subject to the head of the CCGT unit.

2.4 The operational staff of the CCGT unit are subordinated to the chemical engineer of the CCGT unit in production and technical terms.

The work of the operational personnel is supervised by the chemical engineer of the CCGT unit, through the shift supervisors.

2.5 The chemical engineer of the CCGT unit must know and be guided in the work:

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- "Rules for the organization of work with personnel at energy production enterprises", registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan »Tashkent, 2005.

Section I Chapter 1 § 1-10; 13-16;

Section II Chapter 3 § 1, 8;

Chapter 4 § 1, 13, 14.

Annexes No. 1 of Table 3, 4.

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks" in the following volume:

Terms and abbreviations.

Section 1

Section 2 subsections 2.1, 2.3;

subsection 2.4 paragraphs 2.4.22, 2.4.29;

Section 3 subsections 3.6, 3.7.

Attachments: 1 - 6.

- "Fire safety rules for energy companies", Tashkent 2004.

Chapter 1;

Chapter 3;

Chapter 4 § 3, 4;

Annex 1 Chapter 1 § 1-3;

Chapter 4 § 1 paras. 256-260;

Chapter 6 § 2 paragraph 414

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC NTPP";

- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

- KSt 202-810: 2011 "Regulations on the unit of combined cycle gas turbine installations";

- KSt 202-038: 2018 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity";

- The current job description;

- Orders and orders for the station and the chemical unit;

- Directive materials of SJSC Uzbekenergo, operational and emergency response circulars;

- Production instructions of the CCGT unit;

- Laws of the Republic of Uzbekistan "On labor protection"

"On the protection of nature";

- The Labor Code of the Republic of Uzbekistan, Tashkent, 1996.

2.6 The chemical engineer of the CCGT unit should know:

2.6.1 The thermal scheme of the station, the hydrogen cooling circuit of the generator GT, the scheme of the oil system of turbines and transformers;

2.6.2 Technological processes and water-chemical mode of operation of the thermal mechanical equipment of the CCGT unit;

2.6.3 Technological processes and operating modes of water treatment schemes for CCGT units;

2.6.4 Quality standards of all analyzed substances to the CCGT unit;

2.6.5 Standards, technical conditions, methodologies and instructions on quality control of the substance of the CCGT unit;

2.6.6. Methodological, regulatory and other guidelines for the modernization of technological processes of equipment;

2.6.7. Principle of operation, operation rules and verification period for laboratory instruments and equipment installed at the CCGT unit;

2.6.8 Verification and construction of calibration schedules for KFK devices, conductometers, pH meters;

2.6.9 Schemes of process flows, releases; norms of the VCP for CCGT releases;

2.6.10 Conducting technology and chemical control of chemical leaching of equipment;

2.6.11 The technology of preparation and installation of titers of chemical solutions;

2.6.12 Rules and places of sampling for each analyzed object;

2.6.13 Location of fire extinguishing media.

2.7 The verification of the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in violation of rules and instructions, at the request of the bodies of "Sanoatgeocontechnazorat", State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once

in 3 years.

Periodicity of verification of RULES OF SAFETY TECHNIQUE knowledge, rules for the device and safe operation of equipment controlled by the Agency "Sanoategeocontechnazorat" - once a year.

2.8 Primary attestation is conducted after 1 year of work in this position.

The subsequent attestations are carried out according to the results of the passed attestation, but not less often than 1 time in 5 years.

3 Functions and responsibilities

3.1 Conducts organizational and technical measures, prepares technical documentation for conducting and monitoring chemical analyzes with personnel of the CCGT Unit.

3.2 Provides laboratory control of the compliance of quality of reagents, reagents, fuel, materials and finished products with the current standards and technical conditions.

3.3. It monitors the correctness of the water regime of the thermal mechanical equipment, takes measures through the heads of the shifts of the CCGT, the chemical unit and the electric unit to the elimination of deviations from the norms for all analyzed objects.

3.4. Performs constant monitoring of the implementation of the analytical control schedules, the correct and timely maintenance of the documentation of the operational personnel of the unit in the chemical fields.

3.5 He leads the work on the development of new and improvement of existing methods of analytical control and their introduction into production.

3.6 Supervises the development of acid wash programs, provides safety briefings for handling chemical reagents and chemical control during flushing.

3.7 Constructs schedules for chemical control of equipment.

3.8 Participates in the work of the commission for the verification of knowledge by the staff of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, production and job descriptions.

3.9 Participates in carrying out anti-emergency and fire fighting training and instructing staff of the CCGT unit.

3.10 Organizes carrying out of familiarization of the personnel with changes of chemical norms, modes and so on, makes necessary changes in the relevant documents.

3.11 Conducts activities to upgrade the operational staff of the CCGT unit in the chemical sector.

3.12 Reports on wastewater and the chemical regime of the equipment.

4 Rights

4.1 To give orders and instructions to the operational staff of the CCGT unit in accordance with the methods for improving the chemical analysis of equipment.

4.2. Through the shift supervisor, give instructions to the shift staff of the unit on water management issues.

4.3 To suspend the work to be performed and to remove the unit staff in case of violations of the requirements of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY.

5 Relationships

5.1 Carries out all orders of the unit manager of the CCGT.

5.2 Carries out the orders of the chief engineer and brings this to the attention of the unit manager of the CCGT.

5.3 Gives instructions to operational personnel through the shift supervisor of the CCGT.

5.4 Orders of a chemical engineer may be revoked by the unit manager of the CCGT, or, in his absence, by the deputy head of the CCGT unit for operation with subsequent notification.

6 Responsibility

6.1 The chemical engineer of the CCGT unit must comply with the requirements of the current legislation in the activities of subordinated personnel.

6.2 The chemical engineer of the CCGT unit is involved in disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of its functional duties, which resulted in the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Informational data

Designed by the CCGT Unit of OJSC "NTPP"

Head of unit

I. Kh. Abdulloev

Agreed

Production and Technical Department

Head of Department

I.S. Murtazaev

Planning and Economic Department

Head of the department

F. R. Khozhiev

Service reliability of machinery and industrial safety

Head of the service

Kh. O. Muminov

Legal adviser

T.A. Toilokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF LABORATOR OF CHEMICAL ANALYSIS OF
CCPP UNIT**

KSt 202- 860:2012

INTRODUCTION

1 DEVELOPED AND INDUCED BY CHEMICAL UNIT

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF "NTPP"
OJSC
dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

2.5 The laboratory chemist of chemical analysis of the station of the combined-cycle combined cycle gas turbine plants should know and be guided in his work:

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks"

Section 1;

Section 2 subsections: 2.1, 2.2, 2.8;

Section 3 subsections: 3.6;

subsections: 3.7 point "B";

Applications: 2, 3, 4, 5, 7, 8.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005 in the following volume:

Section I Chapter I § 1-10, 13-16;

Section II Chapter 3 § 1, 8;

Chapter 4 § 1, 13, 14;

Applications: tables 3, 4.

- "Fire Safety Rules for Energy Enterprises", Tashkent 2004, in the following volume:

Chapter I;

Chapter II § 3;

Chapter III § 3;

Annex 1: Chapter I § 3;

Chapter IV § 1 paras. 256-260;

Chapter VI § 2 paras. 414-418.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";

- KSt 202-454-94 "Instruction. Chemical regime of boilers ";

- KSt 202-457: 2006 "Instruction. Operational plan for firefighting chemical facilities ";

- KSt 202-458-98 "Instruction. Fire-fighting measures in the chemical unit ";

- KSt 202- 475: 2004 "Instruction. Operational analysis of water and steam at thermal power plants ";

- KSt 202- 490-2006 "Instruction. Regulations on the chemical laboratory ";
- KSt 202-491: 2006 "Instruction. The job description of the laboratory chemist of chemical analysis;
- KSt 202- 493-2007 "Instruction. Safety precautions when working with poisonous substances;
- RH 34-301-489: 2007 "Instruction. Operational analysis of water and steam at TPPs ";
- RH 34-301-703: 2003 "Instruction. Analysis of sewage of thermal power plants ";
- RH 34-301-240: 2007 "Instruction. Exploitation of oil turbine oils";
- "Instructions for first aid to victims in connection with accidents while servicing power equipment";
- Directive materials of SJSC Uzbekenergo, operational and emergency response circulars relating to personnel of the chemical laboratory.

2.6 The chemical laboratory worker should know:

- 2.6.1 Quality standards of all facilities analyzed by the chemical laboratory.
- 2.6.2 Rules and technology for the preparation of chemical solutions and reagents, installation of titles.
- 2.6.3 Places and rules for sampling water, steam, fuel, energy oils, gas in systems of hydrogen cooling of generators, sewage, reagents.
- 2.6.4 Thermal diagram of thermal power plants, hydrogen cooling schemes generators, schemes of oil systems of turbines and transformers.
- 2.6.5. Schemes of WPU, COPS, condensate cleaning, evaporation plants, process effluents of OJSC "NTPP".
- 2.6.6 Principle of operation, operating rules and verification dates laboratory instruments and equipment.
- 2.6.7 GOSTs, methods for conducting water quality analysis, steam, gas, fuel, energy oils, gas contamination.
- 2.7 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job description and production instructions must be carried out:
 - primary - before admission to independent work;
 - periodic - for RULES OF TECHNICAL OPERATION at least once every 3 years, for RULES OF SAFETY TECHNIQUE 1 time per year;
 - extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, higher authorities on the decision of a special commission.
- Periodic testing of knowledge of RULES OF TECHNICAL OPERATION, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.
- 2.8 The location of the laboratory chemist of chemical analysis in the chemical analysis laboratory of the CCGT.

2.9 Service area of the laboratory chemist of chemical analysis unit CCGT: equipment for automatic analysis of CCGT, Chemical water treatment (CWT) of CCGT Unit and UOPS of CCGT.

3 Functions and responsibilities

3.1 Conducts analytical quality control of water, steam, reagents, electrolyte with the frequency, stipulated by the schedule of chemical control of the day laboratory.

3.2 Controls the quality of energy oils of fresh and operational, operation of oil equipment.

3.3 Performs a complete gas analysis in hydrogen cooling generators and an electrolysis plant.

3.4 Controls the quality of all fuels according to the schedule chemical control.

3.5 Controls industrial premises of CCGT for gas contamination at approvals for repair work, gas hazardous wells.

3.6 Prepares the reagents needed for the current operational chemical control, for automatic control devices, determines the and sets the titres of solutions.

3.7 Controls the quality of waste water for all releases.

3.8 Conducts technical documentation for each type of work performed.

3.9 Takes part in receiving equipment after the capital and current repairs for cleanliness, conducts chemical control at chemical cleaning of thermal mechanical equipment.

3.10 Takes part in developing and mastering new techniques chemical control, GOST.

3.11 Maintains the cleanliness of the premises, workplace, chemical utensils, appliances and equipment.

4 Rights

4.1 Make proposals to increase the reliability and economy of the equipment and instruments, improve the working conditions of the laboratory staff.

4.2 Raise his qualification level.

4.3 Participate in the preparation of applications for providing chemical laboratory with utensils, reagents and chemical control devices.

4.4 Appeal to the head of the unit the order of the head laboratory in case of disagreement with it.

5 Relationships

5.1 Performs all orders of the head of the chemical laboratory, a senior engineer, engineer.

5.2 Carries out an order received from the head of the unit or his deputy and informs the head of the chemical laboratory about it.

5.3 In case of disagreement with the order received, the chemical technologist should notify the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

5.4 On deviations from the quality standards of the analyzed objects and equipment failure laboratory assistant informs the engineer, senior engineer or head of the chemical laboratory.

6 Responsibility

6.1 The laboratory chemist of chemical analysis of the unit of combined cycle gas turbine plants, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

INFORMATIONAL DATA

Developed by Chemical Unit
Head of unit

E. R. Soliev

Agreed

Production and Technical Department
Head of Department

I. S. Murtazaev

Planning and Economic Department
Head of the department

F. R. Khozhiev

Service reliability of machinery and industrial safety
Head of the service

Kh. O. Muminov

Legal adviser

T. A. Toilokov

Responsible for standardization

O. L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF THE HEAD OF CHEMICAL WATER
TREATMENT (CWT) SECTION OF CCPP**

Open Joint-Stock Company “NTPP”
Navoi

KSt 202- 861:2012

INTRODUCTION

1 DEVELOPED AND INDUCED BY CHEMICAL UNIT OF JSC “NTPP”

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF "NTPP"
OJSC
dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

2.5 The head of the CWT section of the CCGT is the direct manager of reliable and economical operation and repair of equipment and the person responsible for the organization of labor by the personnel of the CWT section of the CCGT.

2.6 In the absence of the deputy head of the chemical unit, the head of the section shall perform his duties, in the absence of the head of the section, his duties are assigned to the unit's master.

2.7 The head of the CWT section of the CCGT should know and be guided in his work:

- Indication of PP - 56;
- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";
- Rules of organization of work with personnel at enterprises of energy production registered by the Ministry of Justice of the Republic of Uzbekistan No. 1178 of October 4, 2002;
- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005 in the following volume:
 - Section I Chapter 1. § 1 - 8; 12-16;
 - Section II Chapter 2. § 1, 2, 4;
 - Chapter 3. § 6, 8, 9.
- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", in the following volume:
 - Section 1;
 - Section 2;
 - Section 3;
 - Section 4.
 - Applications.
- "Fire Safety Rules for Energy Enterprises", Tashkent 2004, in the following volume:
 - Chapter I;
 - Chapter II;
 - Chapter III;
 - Chapter IV §1, 3, 4;
 - Appendix No. 1:
 - Chapter I § 1, 2, 3;
 - Chapter IV § 2;
 - Chapter VI § 1, 2;
 - Appendix № 8.

- KSt 202-036-2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";
- RN 34-400: 2008 "Regulations on the management system of labor protection in the energy sector.
- "Safety rules in the gas economy of the Republic of Uzbekistan", Tashkent 2004, in the following volume:
 - Chapter I;
 - Chapter III § 9;
 - Chapter VI;
 - Chapter VII.
- "Rules for the Arrangement and Safe Operation of Vessels Working Under Pressure" Tashkent 1997, in the following volume:
 - Section 1;
 - Section 2;
 - Section 3;
 - Section 4;
 - Section 5;
 - Section 6;
 - Section 7;
 - Section 10.
- "Typical instructions for the prevention and elimination of accidents at thermal stations"
 - Management documents of SJSC "Uzbekenergo"
- Orders and orders of higher managers of OJSC "NTPP"
- "Regulations on the investigation and recording of accidents and other injuries to workers' health at work" approved by the Cabinet of Ministers on June 06, 1997;
- "Instructions for investigating and recording technological irregularities in the operation of power plants, networks and power systems".
- "Rules for the Arrangement and Safe Operation of Cranes", Tashkent 1994;
- KSt 202-117: 2006 "Instruction of the person responsible for the safe production of work by cranes"
 - "Safety rules when working with tools and devices."
 - Instructions and regulations concerning the chemical unit.
 - Directive materials of higher organizations.
- KSt 202- 038: 20008 "Regulations on incentive payments for managers, specialists, employees and workstations for the main results of economic activity";
- RN 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System".
- RN 34-470: 2007 "Regulations on the order of time attendance in the Uzbek energy system".
- "Instructions for first aid to victims in connection with accidents while servicing power equipment";

2.8 Testing the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in violation of rules and regulations, at the request of the Sanoatgeocontehnazorat, the State Energy Inspectorate, higher authorities, by decision of the special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be carried out at least once every 3 years.

Periodicity of RULES OF SAFETY TECHNIQUE knowledge testing, device rules and safe operation of equipment controlled by the Agency "Sanoatgeocontehnazorat" - once a year.

2.9 Primary attestation is conducted after 1 year of work in this position; further attestations are conducted according to the results of the past, but not less than 1 time in 5 years.

2.10 The location of the site manager is located in the administrative building of the site of CWT CCGT.

2.11 The service area of the site manager is the water treatment plant of the CWT CCGT, the system for dosing the reagents into the recovery boiler and the CCGT cooling tower, the sewage treatment plant and the list of equipment, buildings and structures of the respective units assigned to them.

3 Functions and responsibilities

3.1 The main task of the head of the CWT section of the CCGT is to ensure the uninterrupted operation of the site equipment.

3.2 The head of the CWT section of the CCGT fixes the sections of the CWT of the CCGTs for operational personnel, approves the patrol schedule, requires the maintenance of the equipment clean and technical serviceability, and the performance of the technical and economic performance of the chemical unit.

Controls the maintenance of operational and operational logs of the unit.

3.3 Personally, by patrols, monitors the condition of equipment, the implementation of the rules of RULES OF SAFETY TECHNIQUE, Rules of technical operation, RULES OF FIRE SAFETY personnel at workplaces.

3.4 Ensures timely delivery of materials, equipment, tools, special clothing for operation and maintenance of chemical unit equipment.

3.5 Organizes emergency repairs at any time of the day.

3.6 Organizes technical supervision over the construction and reconstruction of the unit, their testing and commissioning.

3.7 Supervises and participates in the adjustment and testing of unit equipment, regulates the release of water to consumers.

3.8 Organize the study of operational personnel Rules of technical operation, production and job descriptions, systematically checks the knowledge of

personnel rules and instructions. Carry out emergency response training with personnel.

3.9 Develops organizational and technical measures to improve the reliability of work and equipment, the introduction of new technology, mechanization of labor, scientific organization of labor, elimination of the consequences of accidents, saving fuel and electricity, increasing labor productivity in order to reduce the cost of transport, heat and the organization of their implementation.

3.10 Conducts an instruction to the site staff on the rules of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY.

3.11 Organizes and conducts work with the site staff in accordance with the rules of organization of work with personnel at energy production enterprises.

3.12 Conducts work on certification and rationalization of workplaces for the correct application of forms and systems of wages and material incentives.

4 Rights

4.1 Bring administrative and technical orders to the entire staff of the unit.

4.2 Provides for approval to the head of the unit the proposals on awarding or imposing penalties on persons of subordinate personnel.

4.3 If there is a malfunction in the operation of the equipment, it suspends the operation of the equipment.

4.4 Eliminates the work of persons who violate the rules of Safety technique and fire safety.

4.5 In consultation with the Station shift head and the shift head of the CCGT, sets and changes the operation mode of the equipment.

4.6 Participates in the commissions for the investigation of accidents, irregularities in work and accidents occurring in the unit.

4.7 It records the orders in the order journal.

4.8 Gives out an order for the production of works and is the responsible leader on the side.

4.9 Take concrete measures to save reagents.

5 Relationships

5.1 Agrees all operational shifts with the CCGT shift supervisor.

5.2. Provides requests to the head of the shift station for the withdrawal of equipment for repair, reserve.

5.3 Coordinates with the heads of the CCGT shift and with the CCGT operators all the switchings to the CWT of the CCGT, related to the change in costs.

5.4 Withstands the chemical regime according to the schedule.

5.5 Accepts from the subordinate staff applications for work, rational offers, complaints and claims, for a short time gives a response to the staff.

5.6 Operative personnel notifies the head of the unit section of any equipment malfunction and regime change.

5.7 Operational personnel is administratively subordinated to the head of the site of the unit and carries out his instructions.

6 Responsibility

6.1 The head of a section of the chemical unit of combined-cycle gas turbine plants must comply with the requirements of the current legislation in the activity of subordinated personnel.

6.2 The head of a chemical section of combined cycle gas turbine plants is involved in disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of his functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan .

INFORMATIONAL DATA

Developed by Chemical Unit

Head of unit

E. R. Soliev

Agreed

Production and Technical Department

Head of Department

Murtazaev

I. S.

Planning and Economic Department

Head of the department

Khozhiev

F. R.

Service reliability of machinery and industrial safety

Head of the service

Muminov

Kh. O.

Legal adviser

Toilokov

T. A.

Responsible for standardization

Zelenskaya

O. L.

COMPANY STANDARD

**JOB DESCRIPTION OF THE OPERATOR OF WATER TREATMENT
PLANT OF THE CCPP UNIT**

Preface

- [illegible]

Approved by

Chief engineer of JSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

**JOB DESCRIPTION OF THE OPERATOR OF WATER TREATMENT
PLANT OF THE CCPP UNIT**

Valid from

to

1 Field of application

These regulations have been developed on the basis of KSt 202-451:2003 "Regulations on chemical unit," the Qualifying directory of the positions of managers, experts and employees in 1987, in order to regulate functions, responsibilities, rights and liability of combined cycle steam-gas turbine plant's water treatment plant's operator and is mandatory for him.

2 General terms

2.1 Combined cycle steam-gas turbine plant's water treatment plant's operator must have higher technical education and work experience at least 1 year or vocational education, and work experience at least 3 years. Without special education - work experience at least 5 years.

2.2 Combined cycle steam-gas turbine plant's water treatment plant's operator is appointed, transferred and dismissed by the order of the Company Director on recommendation of chief of CCGT unit, of the human resource in accordance with the requirements of the Labour Code of the Republic of Uzbekistan.

2.3 In the administrative and technical aspects the operator is subordinate to the head of the chemical section of the CCGT, in operational – to the shift supervisor of chemical unit, shift supervisor of CCGT and chemical engineer of the CCGT.

2.4 Combined cycle steam-gas turbine plant's water treatment plant's operator should know and be guided in his work by:

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", 1985, in the following volume:

Section 1

Section 2 subsections 2.1-2.5, 2.8;

Section 3 subsection 3.7;

Section 4 subsection 4.1 paragraphs 4.1.1 to 4.1.3,

Subsection 4.2 items 4.2.1, 4.2.7, 4.2.12;

Appendices 1, 2, 3, 4, 5, 7, 8.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005:

Section I Chapter I § 1 paras. 6,12,13;

§ 4 paras. 69-72;

Section II Chapter 3 § 8 paras. 394, 425, 430,431;

Appendix No. 1 of Table 3, 4.

- "Instructions for first aid to victims in connection with accidents in service power equipment ";

- "Fire Safety Rules for Energy Enterprises", Tashkent 2004 in the following volume:

Chapter 1;

Chapter 3;

Chapter 4;

Chapter 5;

Appendix № 5.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- KSt 202-457: 2007 "Operational plan for fire fighting of CHEMICAL WATER TREATMENT facilities";

- KSt 202-458: 98 "Measures of fire safety in CHEMICAL WATER TREATMENT";
- KSt 202-133: 2007 "Labor protection for CHEMICAL WATER TREATMENT workers";
- KSt 202- 451: 2003 "Regulations on CHEMICAL WATER TREATMENT";
- KSt 202- 463: 2008 "Prevention and elimination of accidents in CHEMICAL WATER TREATMENT";
- KSt 202- 461: 2008 "Operation of mechanical (clarifying) filters";
- KSt 202-464: 94 "Operation of ion-exchange filters of the desalting plant";
- KSt 202- 468: 95: 2008 "Operation of pumps and electric motors";
- KSt 202- 588: 2008 "Operation of a sulfuric acid warehouse".
- KSt 202- 478: 2000 "Operation of an installation for cleaning oily and worn-out effluents";
- KSt 202-455: 98 "Operation of pre-cleaning and neutralization unit";
- KSt 202- 474: 2007 "Instructions for the preparation of solutions of reagents and their supply to production";
- KSt 202-466: 2008 "Job description of the CHEMICAL WATER TREATMENT workers";
- KSt 202-036-2007 "Rules of internal labor regulations employees of OJSC "NTPP".

2.5 The operator of the water treatment plant of the combined-cycle gas turbine plants should know:

- Schemes of water treatment plants: demineralized water and UOPS, pre-cleaning and chemical reagents;
- Limit values of the established quality indicators - coagulated, clarified water, cationized and anionized, demineralized, clarified water from UOPS and wastewater;
- The regime maps of water purification of CHEMICAL WATER TREATMENT, UOPS and pre-cleaning;
- Territorial location of equipment, pipelines of valves and structures of the chemical unit;
- Design and operational characteristics of the equipment of CHEMICAL WATER TREATMENT CCGT, UOPS and pre-cleaning;
- Power supply circuits for electrical equipment, lighting;
- Schemes of technological effluents of CHEMICAL WATER TREATMENT CCGT, UOPS and pre-cleaning;
- Location of fire-extinguishing media;
- Properties of chemical reagents used in the chemical unit, CCGT and reagents prepared to adjust the water and chemical regime of the station;
- Methods for determination of water analysis, regeneration solutions, working solutions of ammonia, phosphate solution, hydrazine, coagulant;
- Schemes for the preparation of chemical reagents and pumping them for production;

- Plans for the discharge, storage and pumping of chemical reagents;
- Schemes of water treatment at the UOPS and pumping them.

2.6 Verification of the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, Supervisory authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of testing RULES OF SAFETY TECHNIQUE knowledge, rules of the device and Safe operation of equipment controlled by the Agency "Sanoatgeoconotechnazorat", the following: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.7 When transferring to another workplace, the workers must undergo an extraordinary briefing and duplication of at least 2 shifts.

2.8. The location of the operator of CCGTs, UOPS is located in the CCGT unit.

2.9 Service area of the CCGT operator: pre-treatment of water from the CCGT, filter room, reagent dilution unit, tank farm and equipment of the UOPS, pumping out the raw water of the CCGT.

3 Functions and responsibilities

3.1 On duty at the workplace according to the schedule approved by the head of the CHEMICAL WATER TREATMENT unit.

3.2 Accept, hand over the shift, in accordance with the Rules for the Technical Operation of Power Stations and Networks of the Republic of Uzbekistan (Section I Chapter I § 4), established for the shifted (operational) personnel.

3.3 Maintain reliable and uninterrupted technological processes of chemical treatment and water treatment, issue demineralized water of established quality for CCGTs:

- Treatment of sewage at the UOPS.

3.4 Maintain technological control over the operating mode of the equipment to be serviced, chemical and visual control of water quality after each stage of its processing.

3.5 To make technological operations of ion-exchange, mechanical filters without deviations from regime maps.

3.6 Monitor the presence of reagent solutions in the supply containers, if necessary, prepare and pump them, check the concentration.

3.7 If necessary, start and stop the equipment, switch in the schemes of the water treatment plant under the supervision of the head of the CCGT site, the chemical engineer.

3.8 Prepare jobs for outfits and orders.

3.9 Maintain records in the daily statements, in the journals of technological operations, in the register of reagent consumption, in the journal of defects, and in CHEMICAL WATER TREATMENT CCGT and COPS - in operational journals.

3.10 Keep the workplace and fixed equipment clean.

3.11 Do not allow unauthorized persons to access the equipment, or repair personnel without proper authorization.

3.12 Monitor the safety of equipment, household and fire equipment.

3.13 In case of accidents in the chemical unit of the CCGT, act in accordance with KSt 202-463: 94 "Prevention and elimination of accidents in the chemical unit".

3.14 In the event of a fire, act in accordance with with KSt 202-457: 2007 Operational plan for firefighting of chemical facilities at the CCGT unit".

4 Rights

4.1 Make proposals for improving the reliability and economy of the equipment.

4.2 Raise your qualification group.

4.3 Require the administration of the unit to provide the tools, devices, reagents, chemical utensils, overalls necessary for the production of work, means of protection, and improvement of working conditions.

4.4 Remove the repair personnel from the workplace that violates the safety rules and the internal labor regulations of the plant and notify the head of the chemical unit shift.

4.5 Independently change the technological regime on the serviced site, the scheme, in accordance with the production need, according to the regime map with the subsequent immediate notification of the head of the chemical unit shift and the shift supervisor of the CCGT, the head of the CCGT unit.

5 Relationships

5.1 Perform all orders of the head and deputy head of the chemical department, the head of the CCGT unit and the operational orders of the chemical engineer of the CCGT.

In case of disagreement with the received order, the operator must notify the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

To verify the correctness of the understanding or the order received, be sure to repeat it to the person who gave the order.

5.2 In the event that an order is received directly from the superiors of the power plant, the operator must comply with it and inform the chemical engineer of the CCGT and the head of the shift of the CHEMICAL WATER TREATMENT unit.

5.3 In case of operational telephone calls with personnel, call your name, and then transfer or receive orders or messages.

5.4 Operators of the water treatment plant of the CCGT, UOPS notify the head of the CCGT unit about the malfunctions, defects and abnormalities in the operation of the water treatment equipment, and the operator records in the defect log and, if necessary, urgently eliminates defects, directs the locksmith for the maintenance of the chemical unit equipment, duty staff of the CCGT

6 Responsibility

6.1 The operator of the water treatment plant of the combined-cycle plant of the chemical unit, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Information data

Developed by

Chemical unit

Head of the unit

E. R. Soliev

Agreed by

Production and technical Department

Head of department

I.S. Murtazaev

Planning and Economics Department

Head of department

F.R. Khojieva

Service of equipment reliability and industrial safety

Head of service

Kh.O. Muminov

Legal advisor

T.A.Toylokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF WATER
TREATMENT UNIT OF CCPP UNIT**

OPEN JOINT STOCK COMPANY "NTPP"
Navoi

Preface

- 1 DEVELOPED AND INTRODUCED by the Chemical unit
- 2 APPROVED AND put INTO EFFECT by the Order of JSC "NTPP"
No. dated
- 3 INTRODUCED FOR THE FIRST TIME

Approved by

Chief engineer of JSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF WATER
TREATMENT UNIT OF CCPP UNIT**

Valid from

to

1 Field of application

This instruction was developed on the basis of KSt 202-451: 2003 "Regulations on the chemical unit", the Qualification reference book for the positions of managers, specialists and employees 1987, in order to regulate the functions, duties, rights and responsibilities of the patrol-operator of the water treatment plant of the combined-cycle steam turbine plants, and obligatory for him.

2 General terms

2.1 The patrol-operator of the water treatment plant of the unit of combined cycle gas turbine plants should have a higher technical education and work experience in production not less than 1 year or secondary specialized education and work experience at least 3 years. In the absence of special education, the work experience in the industry is at least 5 years.

2.2 The patrol-operator of the water treatment plant of the combined-cycle steam and gas-turbine plant is appointed, moved and dismissed from the position by the director of the enterprise upon presentation of the manager of the CCGT

unit, the personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3 The patrol-operator in the administrative and technical respect submits to the head of the chemical section of the CCGT, and in the operational - to the head of the chemical unit shift, the head of the CCGT shift and the chemical engineer of the CCGT.

2.4 The patrol-operator of the water treatment plant of the combined-cycle gas turbine plants should know and be guided in their work:

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks", 1985, in the following volume:

- Section 1

- Section 2 subsections 2.1-2.5, 2.8;

- Section 3 subsection 3.7;

- Section 4 subsection 4.1 paragraphs 4.1.1 to 4.1.3,

- Subsection 4.2 items 4.2.1, 4.2.7, 4.2.12;

- Appendices 1, 2, 3, 4, 5, 7, 8.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005:

- Section I Chapter I § 1 paragraphs 6, 12, 13;

- § 4 paras. 69-72;

- Section II Chapter 3 § 8 paras. 397, 425, 430, 431;

- Appendix No. 1 of the table: 3.4.

- "Instructions for first aid to victims in connection with accidents in the maintenance of power equipment ";

- "Fire Safety Rules for Energy Enterprises", Tashkent 2004, in the following volume:

- Chapter 1;

- Chapter 3;

- Chapter 4;

- Chapter 5;

- Appendix № 5.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- KSt 202-457: 2007 "Instruction. Operational plan for fire extinguishing of CWT (chemical water treatment) facilities ";

- KSt 202-458: 98 "Instruction. Measures of fire safety in CWT ";

- KSt 202-133: 2007 "Instruction. Labor protection for CWT masters ";

- KSt 202-451: 2003 "Regulations on CWT";

- KSt 202-463: 2008 "Instruction. Prevention and elimination of accidents in CWT ";

- KSt 202- 461: 2008 "Instruction. Operation of mechanical (clarifying) filters ";

- KSt 202-464: 94 "Instruction. Operation of ion-exchange filters of the desalting plant ";

- KSt 202-468: 95 "Instruction. Operation of pumps and electric motors of CWT ";

- KSt 202-588: 2008 "Instruction. Operation of a sulfuric acid storage facility. "

- KSt 202- 478: 2000 "Instruction. Operation of an installation for cleaning oily and worn-out drains ";

- KSt 202-455: 98 "Instruction. Operation of pre-cleaning and neutralization unit ";

- KSt 202-474: 2007 "Instructions for the preparation of solutions of reagents and their supply to production";

- KSt 202-466: 2008 "Job description of the CWT masters";

- KSt 202-036-2007 "Rules of internal labor regulations employees of OJSC "NTPP".

2.5 The patrol-operator of the water treatment plant of the combined-cycle steam turbine-turbine plant should know:

- Schemes of water treatment plants: demineralized water and UOPS, pre-cleaning and chemical reagents;

- The regime maps of water purification of CWT, UOPS and pre-cleaning;

- Limit values of the established quality indicators - coagulated, clarified water, cationized and anionized, demineralized, clarified water from UOPS and wastewater;

- Territorial location of equipment, pipelines of valves and structures of the chemical unit;

- Design and operational characteristics of the equipment of CWT CCGT, UOPS and pre-cleaning;
 - Power supply circuits for electrical equipment, lighting;
 - Schemes of technological effluents of CWT CCGT, UOPS and pre-cleaning;
 - Location of fire-extinguishing media;
 - Properties of chemical reagents used in the chemical unit, CCGT and reagents prepared to adjust the water and chemical regime of the station;
 - Methods for determination of water analysis, regeneration solutions, working solutions of ammonia, phosphate solution, hydrazine, coagulant;
 - Schemes for the preparation of chemical reagents and pumping them for production;
 - Plans for the discharge, storage and pumping of chemical reagents;
 - Schemes of water treatment at the UOPS and pumping them.

2.6 Verification of the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- Extraordinary - in violation of rules and regulations, at the request of the State Supervision Authority, State Energy Inspectorate, Supervisory authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of testing RULES OF SAFETY TECHNIQUE knowledge, rules of the device and Safe operation of equipment controlled by the Agency "Sanoatgeocontechnazorat", the following: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.7 When transferring to another workplace, the patrol-operator must undergo an extraordinary briefing and duplication of at least 2 shifts.

2.8. The location of the patrol-operator of the water treatment plant of the CCGT, the UOPS is located in the CCGT unit.

2.9 Service zone of the patrol-operator of the water treatment plant of the CCGT: the preliminary treatment room of the CCGT, the filter room, the reagent dilution unit, the pumping station for raw water from the CCGT Unit.

3 Functions and responsibilities

3.1 On duty at the workplace according to the schedule approved by the head of the CWT unit.

3.2 Accept, hand over the shift, in accordance with the Rules for the Technical Operation of Power Stations and Networks of the Republic of Uzbekistan (Section I Chapter I § 4), established for the shifted (operational) personnel.

3.3 Maintain reliable and uninterrupted technological processes of chemical treatment and water treatment, issue demineralized and clarified water of established quality for CCGTs:

- Treatment of sewage at the UOPS.

3.4 Maintain technological control over the operating mode of the equipment to be serviced, chemical and visual control of water quality after each stage of its processing.

3.5 Produce technological operations of ion-exchange, coal, mechanical filters and ultrafilters without deviating from the regime maps.

3.6 If necessary, prepare and pump reagent solutions, check their concentration.

3.7 If necessary, start and stop the equipment, switch in the schemes of the water treatment plant under the supervision of the head of the CCGT site, the chemical engineer.

3.8 Prepare jobs for outfits and orders.

3.9 Keep records in daily subscriptions, in journals technological operations, in the register of reagents consumption, in the journal of defects, and in the CWT of the CCGT and KOPS - in operational journals.

3.10 Keep the workplace and fixed equipment clean.

3.11 Do not allow unauthorized persons to access the equipment, or repair personnel without proper authorization.

3.12 Monitor the safety of equipment, household and fire equipment.

3.13 In case of accidents in the chemical unit of the CCGT, act in accordance with KSt 202-463: 1994 "Prevention and elimination of accidents in the chemical unit".

3.14 In the event of a fire, act in accordance with KSt 202-457: 2007 "Operational plan for fire fighting of chemical unit facilities".

3.15 If necessary, the operator of the water treatment plant of the CCGT must perform the duties of the operator of the water treatment plant of the CCGT, the operator of the CCGT, the operator of the UOPSS CCGT.

4 Rights

4.1 Make proposals for improving the reliability and economy of the equipment.

4.2 Raise his qualification group.

4.3 Require the administration of the unit to provide the tools, devices, reagents, chemical utensils, overalls necessary for the production of work, means of protection, and improvement of working conditions.

4.4 Remove the repair personnel from the workplace that violates the safety rules and the internal labor regulations of the plant and notify the head of the chemical unit shift.

4.5 Independently change the technological regime on the serviced site, the scheme, in accordance with the production need, according to the regime map with the subsequent immediate notification of the head of the chemical unit shift and the shift supervisor of the CCGT, the head of the CCGT unit.

5 Relationships

5.1 To carry out all orders of the head and deputy head of the chemical unit, the head of the CCGT site and the operational orders of the chemical engineer of the CCGT.

In case of disagreement with the received order, the patrol-operator must declare this to the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

To verify the correctness of the understanding or the order received, be sure to repeat it to the person who gave the order.

5.2 In the event that an order is received directly from the superiors of the power plant, the operator must comply with it and inform the chemical engineer of the CCGT and the head of the shift of the CWT unit.

5.3 In case of operational telephone calls with personnel, call your name, and then transfer or receive orders or messages.

5.4 Patrol-operators of the water treatment plant of the CCGT, UOPS report to the head of the CCGT shift, the head of the CWT shift, the head of the CCGT section about the faults, defects and abnormalities in the operation of the water treatment equipment, record in the defect log and, if necessary, a mechanic for the maintenance of the equipment of the chemical unit, or calls the duty personnel of the CCGT

6 Responsibility

6.1 Patrol-operator of the water treatment plant of the unit of combined-cycle turbine plants of the chemical unit depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of their functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Information data

Developed by

Chemical unit

Head of the unit

E. R. Soliev

Agreed by

Production and technical Department

Head of department

I.S. Murtazaev

Planning and Economical Department

Head of department

F.R. Khojieva

Service of equipment reliability and industrial safety

Head of service

Kh.O. Muminov

Legal advisor

T.A.Toylokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF OPERATOR OF INSTALLATION FOR
CLEANING OF INDUSTRIAL DRAIN OF CCPP UNIT**

OPEN JOINT STOCK COMPANY "NTPP"
Navoi

Preface

- 1 DEVELOPED AND INTRODUCED by the Chemical unit
- 2 APPROVED AND put INTO EFFECT by the Order of JSC "NTPP"
No. dated
- 3 INTRODUCED FOR THE FIRST TIME

Approved by

Chief engineer of JSC "NTPP"

T. G. Nazarov

COMPANY STANDARD

**JOB DESCRIPTION OF OPERATOR OF INSTALLATION FOR
CLEANING OF INDUSTRIAL DRAIN OF CCPP UNIT**

Valid from

to

1 Field of application

This instruction was developed on the basis of KSt 202-451: 2003 "Regulations on the chemical unit", the Qualification directory of the posts of managers, specialists and employees 1987, for the purpose of regulating the functions, duties, rights and responsibilities of the operator of the plant for cleaning industrial drain of the combined cycle gas turbine plants is mandatory for him.

2 General terms

2.1 The operator of the plant for the treatment of industrial effluents of the combined-cycle combined cycle gas turbine plants should have a higher technical education and at least 1 year or secondary specialized education and work experience at least 3 years. In the absence of a special education, the length of service in production not less than 5 years.

2.2 The operator of the plant for the treatment of industrial effluents of the combined-cycle combined cycle gas turbine plants is appointed, moved and dismissed from the position by the director of the enterprise upon presentation of the unit manager of the CCGT, personnel department in accordance with the requirements of the Labor Code of the Republic of Uzbekistan.

2.3 The operator administratively and technically submits to the head of the chemical section of the CCGT, and in the operational - to the head of the shift

of the chemical unit, to the head of the CCGT shift and to the chemical engineer of the CCGT.

2.4 The operator of the plant for the treatment of industrial effluents of the unit of combined-cycle combined cycle gas turbine plants should know and be guided in their work:

- "Safety rules for the operation of thermal mechanical equipment of power plants and heating networks" 1985, in the following volume:

- Section 1

- Section 2 subsections 2.1-2.5, 2.8;

- Section 3 subsection 3, 7;

- Section 4 subsection 4.1 paragraphs 4.1.1 to 4.1.3,

- Subsection 4.2 items 4.2.1, 4.2.7, 4.2.12;

- Appendices 1, 2, 3, 4, 5, 7, 8.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005:

- Section I Chapter I § 1 paragraphs 6, 12, 13;

- § 4 paras. 69-72;

- Section II Chapter 3 § 8 paras. 394, 425, 430, 431;

- Appendix No. 1 of Table 3, 4.

- "Instructions for first aid to victims in connection with accidents at service power equipment";

- "Fire Safety Rules for Energy Enterprises", Tashkent 2004, in the following volume:

- Chapter 1;

- Chapter 3;

- Chapter 4;

- Chapter 5;

- Appendix № 5.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On Approval of the Rules for the Use of Electric and Thermal Energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- KSt 202-457: 2007 "Instruction. Operational plan for fire extinguishing of Chemical water treatment (CWT) facilities ";

- KSt 202-458: 98 "Instruction. Measures of fire safety in CWT ";

- KSt 202- 133: 2007 "Instruction. Labor protection for CWT masters";

- KSt 202- 451: 2003 "Regulations on CWT";
- KSt 202- 463: 2008 "Instruction. Prevention and elimination of accidents in CWT ";
- KSt 202- 461: 2008 "Instruction. Operation of mechanical (clarifying) filters ";
- KSt 202-464: 94 "Instruction. Operation of ion-exchange filters of the desalting plant ";
- KSt 202- 468: 95: 2008 "Instruction. Operation of pumps and electric motors ";
- KSt 202- 588: 2008 "Instruction. Operation of a sulfuric acid storage facility. "
- KSt 202- 478: 2000 "Instruction. Operation of an installation for cleaning oily and worn-out drains ";
- KSt 202-455: 98 "Instruction. Operation of pre-cleaning and neutralization unit ";
- KSt 202- 474: 2007 "Instructions for the preparation of solutions of reagents and their supply to production";
- KSt 202- 466: 2008 "Job description of the CWT masters";
- KSt 202- 036-2007 "Rules of internal labor regulations employees of OJSC "NTPP".

2.5 The operator of the plant for the treatment of industrial effluents of the unit of combined cycle gas turbine plants should know:

- Schemes of water treatment plants: demineralized water and UOPS, pre-cleaning and chemical reagents;
- Limit values of the established quality indicators - coagulated, clarified water, cationized and anionized, demineralized, clarified water from OPSS and wastewater;
- The regime maps of water purification of CWT, UOPS and pre-cleaning;
- Territorial location of equipment, pipelines of valves and structures of the chemical unit;
- Design and operational characteristics of the equipment of CWT CCGT, UOPS and pre-cleaning;
- Power supply circuits for electrical equipment, lighting;
- Schemes of technological effluents of CWT CCGT, UOPS and pre-cleaning;
- Location of fire-extinguishing media;
- Properties of chemical reagents used in the chemical unit, CCGT and reagents prepared to adjust the water and chemical regime of the station;
- Methods for determination of water analysis, regeneration solutions, working solutions of ammonia, phosphate solution, hydrazine, coagulant;
- Schemes for the preparation of chemical reagents and pumping them for production;
- Plans for the discharge, storage and pumping of chemical reagents;
- Schemes of water treatment at the OPSS and pumping them.

2.6 Verification of the knowledge of Rules of technical operation, Rules of safety technique, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in violation of rules and regulations,

at the request of the State Supervision, State Energy Inspectorate, Supervisory authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of testing Rules of safety technique knowledge, rules of the device and Safe operation of equipment controlled by the Agency "Sanoatgeocontechnazorat", the following: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.7 When transferring to another workplace, the operator must undergo an extraordinary briefing and duplication of at least 2 shifts.

2.8. The operator's location in the premises of the UOPS of the CCGT.

2.9 Service area of the operator UOPS CCGT: pre-treatment room of water CCGT, filter room, reagent dilution unit, tank farm and equipment, pumping station for raw water CCGT.

3 Functions and responsibilities

3.1 On duty at the workplace according to the schedule approved by the head of the CWT unit.

3.2 Accept, hand over the shift, in accordance with the Rules for the Technical Operation of Electric Power Stations and Networks of the Republic of Uzbekistan (Section I Chapter I § 4), established for the shifted (operational) personnel.

3.3 Maintain reliable and uninterrupted technological processes of chemical treatment and purification of industrial wastes of CCGT.

3.4 Maintain technological control over the operating mode of the equipment to be serviced, chemical and visual control of water quality after each stage of its processing.

3.5. Make technological operations for deposition, neutralization and purification of effluents by filtration, without deviations from regime maps.

3.6 Monitor the presence of reagent solutions in the supply containers, if necessary, prepare and pump them, check the concentration.

3.7 If necessary, start and stop equipment, under the supervision of the head of the CCGT unit, a chemical engineer, switching in the schemes of the CCGT.

3.8 Prepare jobs for outfits and orders.

3.9 To keep records in the daily statements, in the journals of technological operations, in the register of reagents consumption, in the journal of defects, and in the CWT of the CCGT and UOPS - in the operational journals.

3.10 Keep the workplace and fixed equipment clean.

3.11 Do not allow unauthorized persons to access the equipment, or repair personnel without proper authorization.

3.12 Monitor the safety of equipment, household and fire equipment.

3.13 In case of accidents in the chemical unit of the CCGT, act in accordance with KSt 202-463: 94 "Prevention and elimination of accidents in the chemical unit".

3.14 In the event of a fire, act in accordance with KSt 202-457: 2007 "Operational plan for firefighting of chemical facilities at the CCGT".

3.15 If necessary, the operator of the CCGT should perform the duties of the operator of the water treatment plant of the CCGT, the operator of the wastewater treatment plant of the CCGT, the patrol operator of the CCGT

4 Rights

4.1 Make proposals for improving the reliability and economy of the equipment.

4.2 Raise his qualification group.

4.3 Require the administration of the unit to provide the tools, devices, reagents, chemical utensils, overalls necessary for the production of work, means of protection, and improvement of working conditions.

4.4 Remove repair personnel from the workplace that violates safety regulations and internal labor regulations of the plant and notify the head of the chemical unit shift.

4.5 Independently change the technological regime on the serviced site, the scheme, in accordance with the production need, according to the regime map with the subsequent immediate notification of the head of the chemical unit shift and the shift supervisor of the CCGT, the head of the CCGT unit.

5 Relationships

5.1 To carry out all orders of the head and deputy head of the chemical unit, the head of the CCGT site and the operational orders of the chemistry engineer of the CCGT.

In case of disagreement with the received order, the operator must notify the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

To verify the correctness of the understanding or the order received, be sure to repeat it to the person who gave the order.

5.2 In the event that an order is received directly from the superiors of the power plant, the operator must comply with it and inform the chemical engineer of the CCGT and the head of the shift of the CWT unit.

5.3 In case of operational telephone calls with personnel, call your name, and then transfer or receive orders or messages.

5.4 The operator of the plant for the treatment of industrial effluents of the CCGT, UOPS of the CCGT notifies the CCGT shift supervisor, the head of the CWT shift, the head of the CCGT CWT department about the malfunctions, defects and abnormalities in the operation of the water treatment equipment, make entries in the fault log and, if necessary, directs the fitter to maintain the equipment of the chemical unit, or calls the duty personnel of the CCGT.

6 Responsibility

6.1 The operator of the industrial sewage treatment plant of the combined-cycle plant gas turbine plants depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for non-fulfillment or improper performance of their functional duties that led to the occurrence of accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

Information data

Developed by

Chemical unit

Head of the unit

E. R. Soliev

Agreed by

Production and technical Department

|Head of department

I.S. Murtazaev

Planning and Economics Department

Head of department

F.R. Khojieva

Service of equipment reliability and industrial safety

Head of service

Kh.O. Muminov

Legal adviser

T.A.Toylokov

Responsible for standardization

O.L. Zelenskaya

COMPANY STANDARD

**JOB DESCRIPTION OF PATROL-OPERATOR OF THE INSTALLATION
FOR THE CLEANING OF THE INDUSTRIAL DRAINS OF CCPP UNIT**

Navoi

KSt 202- 859:2012

INTRODUCTION

1 DEVELOPED AND INDUCED BY CHEMICAL UNIT

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF "NTPP"
OJSC

dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

Section 2 subsections 2.1-2.5, 2.8;

Section 3 subsection 3.7;

Section 4 subsection 4.1 paragraphs 4.1.1 to 4.1.3,

Subsection 4.2 items 4.2.1, 4.2.7, 4.2.12;

Appendices 1, 2, 3, 4, 5, 7, 8.

- "Rules of technical operation of power plants and networks of the Republic of Uzbekistan", Tashkent 2005, in the following scope:

Section I Chapter I § 1 paragraphs 6,12,13;

§ 4 of paragraph 69-72;

Section II Chapter 3 § 8 points 394, 425, 430 431;

Appendix No. 1 of Table 3.4.

- "Instructions for first aid to victims in connection with accidents in the maintenance of power equipment ";

- "Fire Safety Rules for Energy Enterprises", Tashkent 2004, in the following volume:

Chapter I;

Chapter III;

Chapter IV;

Appendix № 5.

- Indication of PP - 56;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";

- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On approval of the rules for the use of electric and thermal energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;

- RH 34-114: 2007 "Regulations on Disciplinary Responsibility of Workers of the Uzbek Energy System";

- KSt 202- 133: 2007 "Instruction. Labor protection for CWT(Chemical water treatment) masters";

- KSt 202- 451: 2003 "Regulations on the chemical unit";

- KSt 202-455: 98 "Instruction. Operation of pre-cleaning and neutralization unit ";

- KSt 202-457: 2007 "Instruction. Operational plan for fire extinguishing of CWT facilities ";

- KSt 202-458: 98 "Instruction. Measures of fire safety in CWT ";

- KSt 202- 461: 2008 "Instruction. Operation of mechanical (clarifying) filters ";

- KSt 202- 463: 2008 "Instruction. Prevention and elimination of accidents in CWT ";

- KSt 202-464: 94 "Operation of ion-exchange filters of the desalting plant";

- KSt 202- 466: 2008 "Job description of the CWT masters";

- KSt 202- 468: 95 "Instruction. Operation of pumps and electric motors of CWT ";
- KSt 202-474: 2007 "Instructions for the preparation of solutions of reagents and their supply to production";
- KSt 202- 478: 2000 "Instruction. Operation of an installation for cleaning oily and worn-out drains ";
- KSt 202- 588: 2008 "Instruction. Operation of a sulfuric acid storage facility. "
- KSt 202- 036: 2007 "Rules of internal labor regulations employees of OJSC "NTPP".

2.5 The patrol-operator of the plant for the treatment of industrial effluents of the combined-cycle turbine plant should know:

- Schemes of water treatment plants: demineralized water and UOPS, pre-cleaning and chemical reagents;
- Limit values of the established quality indicators - coagulated, clarified water, cationized and anionized, demineralized, clarified water from UOPS and wastewater;
- The regime maps of water purification of CWT, UOPS and pre-cleaning;
- Territorial location of equipment, pipelines of valves and structures of the chemical unit;
- Design and operational characteristics of the equipment of CWT CCGT, UOPS and pre-cleaning;
- Power supply circuits for electrical equipment, lighting;
- Schemes of technological effluents of CWT CCGT, UOPS and pre-cleaning;
- Location of fire-extinguishing media;
- Properties of chemical reagents used in the chemical unit, CCGT and reagents prepared to adjust the water and chemical regime of the station;
- Methods for determination of water analysis, regeneration solutions, working solutions of ammonia, phosphate solution, hydrazine, coagulant;
- Schemes for the preparation of chemical reagents and pumping them for production;
- Plans for the discharge, storage and pumping of chemical reagents;
- Schemes of water treatment at the UOPS and pumping them.

2.6 Verification of the knowledge of Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions should be carried out:

- primary - before admission to independent work;
- Periodic - on time;
- extraordinary - in case of violation of rules and instructions, at the request of state supervision bodies, State Energy Inspectorate, Supervisory authorities, by decision of a special commission.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions should be made at least once every 3 years.

Periodicity of testing RULES OF SAFETY TECHNIQUE knowledge, rules of the device and Safe operation of equipment controlled by the Agency "Sanoatgeocontechnazorat", the following: for persons directly connected with the management and maintenance of power plants, as well as for workers of all categories, once a year.

2.7 When transferring to another workplace, the patrol-operator must undergo an extraordinary briefing and duplication of at least 2 shifts.

2.8. The location of the patrol-operator the UOPS of the CCGT is located in the territory of the UOPS CCGT. UOPS.

2.9 Service area of the patrol-operator UOPS CCGT:

hall of preliminary water purification CCGT, filter room, a dilution unit for reagents, a tank farm and equipment for UOPS, pumping out crude water from the CCGT.

3 Functions and responsibilities

3.1 On duty at the workplace according to the schedule approved by the head of the CWT unit.

3.2 Accept, hand over the shift, in accordance with the Rules for the Technical Operation of Electric Power Stations and Networks of the Republic of Uzbekistan (Section I Chapter 4 § 4) established for the shifted (operational) personnel.

3.3 Maintain reliable and uninterrupted technological processes of chemical treatment and purification of industrial wastes of CCGT.

3.4 Maintain technological control over the operating mode of the equipment being serviced, chemical and visual control of water quality after each stage of its processing.

3.5. Make technological operations for deposition, neutralization and purification of effluents by filtration, without deviations from regime maps.

3.6 If necessary, prepare and pump reagent solutions, check the concentration.

3.7 If necessary, start and stop equipment, under the supervision of the head of the CCGT unit, a chemical engineer, switching in the schemes of the CCGT.

3.8 Prepare jobs for outfits and orders.

3.9 Maintain records in the daily statements, in the journals of technological operations, in the register of reagent consumption, in the journal of defects, and in CWT CCGT and UOPS - in operational journals.

3.10 Keep the workplace and fixed equipment clean.

3.11 Do not allow unauthorized persons to access the equipment, or repair personnel without proper authorization.

3.12 Monitor the safety of equipment, household and fire equipment.

3.13 In case of accidents in the chemical unit of the CCGT, act in accordance with KSt 202-463: 94 "Prevention and elimination of accidents in the chemical unit".

3.14 In the event of a fire, act in accordance with KSt 202-457: 2007 "Operational plan for firefighting of chemical facilities at the CCGT".

3.15 If necessary, the patrol-operator of the UOPS CCGT shall perform the duties of the operator of the water treatment plant of the CCGT, the operator of the water treatment plant of the CCGT, the operator of the UOPSS CCGT Unit

4 Rights

4.1 Make proposals for improving the reliability and economy of the equipment.

4.2 Raise his qualification group.

4.3 Require the administration of the unit to provide the tools, devices, reagents, chemical utensils, overalls necessary for the production of work, means of protection, and improvement of working conditions.

4.4 Remove repair personnel from the workplace that violates safety regulations and internal labor regulations of the plant and notify the head of the chemical unit shift.

4.5 Independently change the technological regime on the serviced site, the scheme, in accordance with the production need, according to the regime map with the subsequent immediate notification of the head of the chemical unit shift and the shift supervisor of the CCGT, the head of the CCGT unit.

5 Relationships

5.1 To carry out all orders of the head and deputy head of the chemical unit, the head of the CCGT site and the operational orders of the chemistry engineer of the CCGT unit.

In case of disagreement with the received order, the patrol-operator must declare this to the person who issued the order, but after receiving the confirmation of the order, it fulfills it, if this does not threaten the safety of the personnel or the safety of the equipment.

To verify the correctness of the understanding or the order received, be sure to repeat it to the person who gave the order.

5.2 In the event that an order is received directly from the superiors of the power plant, the operator must comply with it and inform the chemical engineer of the CCGT and the head of the shift of the CWT unit.

5.3 In case of operational telephone calls with personnel, call your name, and then transfer or receive orders or messages.

5.4 Patrol-operator of the industrial sewage treatment plant UOPS CCGT is informed to the shift supervisor of the CCGT, the shift supervisor CWT, the head of the CCGT site about malfunctions, defects and abnormalities in the operation of the water treatment equipment, make entries in the defects log and, if

necessary, eliminate defects immediately, direct the fitter for the maintenance of the chemical unit equipment, or call the duty staff of the CCGT

6 Responsibility

6.1 The patrol-operator of the sewage treatment plant of the combined-cycle plant of the chemical unit, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage property of the employer and other adverse consequences, in accordance with the current legislation of the Republics Uzbekistan.

INFORMATIONAL DATA

Developed by Chemical Unit

Head of unit

E. R. Soliev

Agreed

Production and Technical Department

Head of Department

Murtazaev

I. S.

Planning and Economic Department

Head of the department

Khozhieva

F. R.

Service reliability of machinery and industrial safety

Head of the service

Muminov

Kh. O.

Legal adviser

Toilokov

T. A.

Responsible for standardization

Zelenskaya

O. L.

COMPANY STANDARD

**JOB DESCRIPTION OF SENIOR ELECTRICIAN FOR MAINTENANCE
OF ELECTRICAL EQUIPMENT OF GAS-BOOSTING COMPRESSOR
STATION (GBCS)**

JOINT-STOCK COMPANY “NTPP”

Navoi

INTRODUCTION

1 DEVELOPED AND INTRODUCED BY THE ELECTRIC UNIT

2 APPROVED AND ENTRY INTO ACTION BY THE ORDER OF “NTPP” JSC
dated _____ No.

3 REPLACEMENT OF RD 202-

Approve

Production Director of
JSC "NTPP"

S. KH. Fayziev

COMPANY STANDARD

JOB DESCRIPTION OF SENIOR ELECTRICIAN FOR MAINTENANCE OF ELECTRICAL EQUIPMENT OF GAS-BOOSTING COMPRESSOR STATION (GBCS)

Validity period from

up to

1 AREA OF USE

This job description is developed on the basis of KSt 202-201-2004 "Regulation on the electrical unit" in order to regulate the functions, duties, rights and responsibilities of a senior electrician for maintenance of electrical equipment of GBCS (Gas boosting compressor station) and is mandatory for him. Knowledge is mandatory for the head of electrical unit, the head of the shift station, the duty of control panel and senior duty electrician of GBCS.

2 General terms

2.1 Senior electrician for maintenance of electrical equipment of GBCS provides a safe, reliable and economical operation of electrical equipment attached to it. It monitors the operation of electrical equipment transformers, switchgears, auxiliary in-house equipment, protection devices, signaling, control and electroautomation of electric equipment of GBCS and provides its accident-free and economical operation.

2.2 For the position of a senior electrician of the GBCS, persons who have sufficient theoretical knowledge and practical experience of the field of operation of electrical installations can be appointed, without having to submit requirements for seniority.

2.4 Senior electrician on duty of GBCS is appointed, relocated or released from work by an order to the General Director of JSC NTPP upon presentation of the head of the electric department in accordance with the current legislation.

2.5 Employment period Senior electrician on duty of GBCS must undergo a medical examination in accordance with the requirements of the "Safety Rules for the Operation of Electrical Installations".

2.6 Before being appointed for independent work Senior electrician on duty of GBCS must pass production training, knowledge testing, duplication in the workplace by the guidance of an experienced worker and play one or two emergency trainings in accordance with the "Rules for the organization of work with personnel at energy production enterprises."

- primary - before admission to independent work.
- Periodic - on time.
- extraordinary - in violation of rules and regulations, at the request of the state supervision bodies of the State Inspectorate for the operation of power plants and networks and higher management bodies by decision of special commissions.

Periodic testing of knowledge of Rules of technical operation, RULES OF FIRE SAFETY, production and job descriptions must pass at least 1 time in 1 year.

2.7 Senior electrician on duty of GBCS administratively subordinate to the head of the electrical department and his deputy for operation, and in operational terms directly subordinate to the head of the shift in the electric department, the head of the station shift and receives operational instructions from them.

In the case of an order from a superior head of Senior electrician on duty of GBCS must timely notify the HEAD OF SHIFT OF ELECTRICAL UNIT.

2.8 Tolerance Senior electrician on duty of GBCS for independent work is executed by the order of the head of the electrical department and his deputy.

2.9 The workplace of the electrician on duty of GBCS located in the operator room must be equipped in accordance with standard projects for the organization of workplaces.

2.10 Into the service area Senior electrician on duty of GBCS includes the following equipment:

2.10.1 Power transformers T-1-GBCS, T-2-GBCS, TCN-GBCS-1, TSN-GBCS -2.

2.10.2 Switchgears 6 kV with vacuum circuit breakers and with all installed equipment RUSN-6-GBCS-1, RUSN-6-GBCS-2.

2.10.3. 0.4 kV switchgears with automatic devices and with all installed equipment RUSN-0,4-GBCS-1, RUSN-0,4-GBCS-2.

2.10.4 Power panels and assemblies of the administrative building, T-1-GBCS, T-2-GBCS, the territory of GBCS.

2.10.5. Electric motors of 6 kV and 0.4 kV of all the above objects.

2.10.6 Premises of AB-GBCS with all the installed equipment of the SHPT, VAZP.

2.10.7 RC-GBCS with all installed protective equipment.

2.10.8 Working, evacuation, emergency lighting of GBCS facilities.
Outdoor lighting of GBCS.

2.11 Senior electrician on duty of GBCS should know the following policy documents:

2.11.1 RD 34.20.501 The Rules of technical operation of Chapter 1.1.1.2.1.3.1.4.1.10.1.11.1.13.5.1. 5.2. 5.3, 5.4, 5.5, 5.8, 5.9, 5.10, 5.11, 5.12, 6.7, 6.8, in full.

2.11.2 RD 34.02.202 Safety regulations for the operation of electrical installations in Chapter 1.2.3 in full, Chapter 4 from § 4.1 to § 4.12. chapters 5.7-13,15,16,19-21 in full. Chapter 23§ 23.1 to 23.3, Appendix 1-7. The level of knowledge should correspond not less than IV gr. For electrical safety.

2.11.3 RD 34.03.603 Rules for the application and testing of protective equipment used in electrical installations.

2.11.4 RD 34.03.702 Instruction on rendering first aid to the victims in connection with uncountable cases when servicing power equipment.

2.11.5 RD 34.03.204 Safety rules for working with the tool and the devices § 3.2, 3.3, 5.1, 5.2, 7.6.

2.11.6 RD RUz 34-415-96 Rules of the organization of work with the personnel at the enterprises of power production.

2.11.7 RD 34-03-301-87 Fire safety rules for an energy company. Chapters 1.2.4.15.16.

2.11.8 RD 202-036-98 Rules of internal labor regulations for employees of NTPP.

2.11.9 The Labor Code of the Republic of Uzbekistan. Tashkent, 1996.

2.11.10 RD 202-038-97 Regulations on the awarding of workers, managers, specialists and other workers of the station for the main results of economic activity.

2.12 On technical matters Senior electrician on duty of GBCS should know:

2.12.1. Official and production instructions.

2.12.2 Power supply circuits for 6 and 0.4 kV auxiliary needs within its own plot.

2.12.3. Work, evacuation, emergency lighting schemes and the location of lighting equipment.

2.12.4 Overvoltage protection circuit, scheme and design of equipment grounding devices.

2.12.5. The scheme of power supply of station communication devices.

2.12.6 Principle of operation of relay protection, technological interlocks and automation in the part of the serviced equipment.

2.12.7 Performance characteristics of electrical equipment - electric motors, transformers.

2.12.8 The magnitude and duration of permissible overloads electrical equipment, the maximum permissible temperatures of transformers, electric motors.

2.12.9 Cable facilities of GBCS in the part of the arrangement and arrangement of cable lines and channels.

2.12.10 The territorial arrangement of electrical equipment and its switching equipment.

2.12.11 Methods of detection and elimination of electrical equipment malfunctions.

2.13 Electrician for maintenance of electrical equipment GBCS testing knowledge of the Rules of technical operation, RULES OF SAFETY TECHNIQUE, RULES OF FIRE SAFETY, job descriptions and production instructions must pass

2.14 Performance characteristics and operating principle of gas (SF₆) and vacuum switches.

2.15 Performance characteristics and operating principles Soft start system

2.16 Devices and the principle of operation of electromagnetic and mechanical interlocks in the cells of switchgear - 6kV GBCS.

2.17. The principle of operation of automatic fire extinguishing in the premises of a gas compressor unit.

2.18 Principle of management and operation of the internal security system.

2.19 Controls and operation principle of the MRPU (Microprocessor relay protection unit)

3 Functions and responsibilities

3.1 Electrician for maintenance of electrical equipment GBCS is the person responsible for the uninterrupted and economical operation of the electrical equipment of its site and to ensure that these indicators are condition and proper operation of the equipment.

3.2 Senior electrician on duty of GBCS goes to work according to the schedule approved by the head of the electrical department or his deputy for operation. Violation of the schedule is prohibited. Exchange of shifts is allowed in exceptional cases and in each case with the permission of the head of the electrical department or his deputy.

3.3. Duty for two shifts in a row is prohibited. In the absence of a shift. Senior electrician for maintenance of electrical equipment GBCS must report this to the HEAD OF SHIFT OF ELECTRICAL UNIT, and remain on duty until the shift comes.

3.4 Departure from duty without changing the shift, as well as receiving and handing over the shift without proper registration is prohibited.

3.5 It is forbidden to receive and hand over the shift during the elimination of accidents, the production of responsible switching operations or operations for starting and stopping the equipment. Deviation from this rule in exceptional cases is allowed with the permission of the Station shift head and the Electrical unit head.

3.6 Acceptance and delivery of a shift for faulty equipment or an abnormal mode of operation is allowed only with the permission of the electric department head or his deputy.

3.6.1 Observe the cleanliness and order of the secured area.

3.7 When taking shift Senior electrician on duty of GBCS must:

3.7.1. Familiarize yourself with the electrical scheme of the site.

3.7.2 Perform a patrol to determine the condition of the electrical equipment.

3.7.3. Read all the entries in the operational journal made since the last watch.

3.7.4 Find out from the commissioner of shift in all changes in the operation of electrical equipment, about upcoming switching operations, equipment defects, and new operational and administrative orders.

3.7.5 Review the entries in the Hardware Troubleshooter.

3.7.6 Check for the presence of tools, protective equipment, instructions and diagrams at the workplace.

3.7.7 Issue the report of the HEAD OF SHIFT OF ELECTRICAL UNIT and obtain permission to accept the shift.

3.7.8 To register the receipt and delivery of the shift in a record in the operational journal with the signatures of the receiving and transferring shift, indicating the time of reception and delivery of the shift.

3.7.9 In case of failure of relay protection and automation, notify HEAD OF SHIFT OF ELECTRICAL UNIT and ETL personnel.

3.7.10 Check the serviceability of warning and emergency signaling.

3.8 Taking the shift senior duty electrician is obliged:

3.8.1 Before passing the shift, make a patrol of the electrical equipment of his site.

3.8.2 Issue operational documentation

3.8.3 Verbally inform the receiving shift of all changes in the operation of the equipment during the watch, as well as all new operational orders.

3.8.4 Obtain permission from the HEAD OF SHIFT OF ELECTRICAL UNIT to hand over the shift and place the shift-acceptance of the shift in the paintings in the operational journal.

3.9 Senior electrician on duty of GBCS must:

3.9.1 Strictly observe labor and production discipline, prevent violations of Rules of technical operation, RULES OF SAFETY TECHNIQUE, internal labor regulations, instructions and other directives.

3.9.2. Keep in good order tools, tools, protective and fire-fighting equipment.

3.9.3 If it is found that the protective equipment is not suitable, the service personnel must immediately remove them, inform the master of the site and record in the logbook and the contents of the protective equipment or operational documentation.

3.9.4 Keep the workplace, equipment and facilities clean.

3.9.5 Continually improve their production skills.

3.9.6 Patrol and inspect electrical equipment at least 2-3 times per shift.

3.9.7. Keep the workplaces and equipment in good order.

3.9.8 On the instructions of the HEAD OF SHIFT OF ELECTRICAL UNIT or Station shift head, make operational changes (instructions to the HEAD OF SHIFT OF ELECTRICAL UNIT or station shift head can be transmitted via the electrician of the control board of the control room).

3.9.9 All failures to include automats and disconnectors should be recorded in the fault log.

3.9.10 In case of failures to switch on the machine, disconnectors, immediately notify the shift supervisor, make repeated switch-on after inspecting and evaluating the condition of the automatics and disconnectors.

- 3.9.11 Allow repair personnel to work on orders and orders.
 - 3.9.12 Ensure that the required amount of insulation, wiping material, lamps is replenished regularly in the workplace.
 - 3.9.13 Test the reserve equipment, AVR, inspect the contact connections in accordance with the schedule.
 - 3.9.14 Eliminate defects in equipment, and in case of impossibility of elimination, mark defects in the log.
 - 3.9.15 To comply with all orders of the HEAD OF SHIFT OF ELECTRICAL UNIT, Station shift head and the administration of the unit.
 - 3.9.16 Timely and accurately draw up operational documentation.
 - 3.9.17 In the shift from 0-00 to 8-00 in the operational log, mark the place of installation of portable protective earths.
 - 3.9.18 Portable protective earths shall be stored in fixed locations by numbers.
 - 3.10 During the liquidation of accidents Electrician for maintenance of electrical equipment GBCS is obliged:
 - 3.10.1 Immediately put and fame HEAD OF SHIFT OF ELECTRICAL UNIT, and in its absence station shift head about all violations of the normal equipment regime.
 - 3.10.2 In the event of an accident and a malfunction of the normal operation of the equipment, first of all, it must ensure a reliable supply of its own needs.
 - 3.10.3 In the event of an immediate threat to the life of people or the integrity of the equipment, it is their responsibility to take measures independently and to prevent the danger that has arisen and then immediately inform the HEAD OF SHIFT OF ELECTRICAL UNIT or the station shift head about the incident and the measures taken.
 - 3.10.4 During the liquidation of the accident Electrician for maintenance of electrical equipment GBCS, after taking the necessary independent measures, is acting as directed by the shift head of electrical unit .
- Non-fulfillment or inaccurate fulfillment of operational orders by the shift head of electrical unit is not allowed.
- When liquidating accidents senior duty electrician should be guided by RD 202-221-94
- "Instruction on the liquidation of accidents in the electric part of NTPP".
- 3.10.5 After the elimination of accidents senior duty electrician is obliged to record in the operational journal a detailed description of the nature of the course of the accident and the sequence of the liquidation operation in chronological order.

4 Rights

- 4.1. For the performance of the assigned duties senior duty electrician has the following operational rights:
 - 4.1.1. Make operational switching in the GBCS circuitry.
 - 4.1.2 To enter the premises of electrical facilities for patrol and inspection facilities

- Electrical equipment, production of operational switching and cleaning.
- 4.1.3 Make an admission to work in electrical installations for outfits and orders.
- 4.1.4 Conduct operational negotiations by the operator of the GBCS.
- 4.1.5 Remove from work the perpetrators of violations of the RULES OF SAFETY TECHNIQUE and the Rules of fire safety.
- 4.1.6 Make independent decisions in the event of an emergency situation and a threat to people's lives.
- 4.1.7 Refuse to comply with the order if it is likely to damage the equipment or accidents with people.

5 Relationships

- 5.1 In case of receipt of an order from a higher authority, the senior electrician must inform the head of the electric unit shift in a timely manner.
- 5.2 At the direction of the shift supervisor, the head of the electrical unit shift is obliged to disassemble the circuits of the electrical engines CH.
- 5.3 As instructed by the CCPP-1 shift supervisor, disassemble and assemble the circuits electrical engines with subsequent notification to the HEAD OF SHIFT OF ELECTRICAL UNIT.

6 Responsibility

- 6.1. At senior duty electrician is personally responsible:
- 6.1.1 For the performance or unclear and untimely performance of their duties.
- 6.1.2 For incomplete use of their rights, if as a result of damage to the station.
- 6.1.3 For violation of current regulations, regulations, Rules of technical operation, RULES OF SAFETY TECHNIQUE, fire safety rules.
- 6.1.4 For failure to comply with the orders of the station shift head, the head of electrical unit, the head of the electrical department and the deputy head of the unit.
- 6.1.5 For erroneous actions in the production of operational switching.
- 6.1.6 For unreasonable and uncoordinated changes in the modes of equipment and electrical circuits.
- 6.1.7 For incorrect and untimely execution of operational documentation.
- 6.1.8 For the started, dirty condition of the fixed equipment and the workplace.
- 6.1.9 For damage and loss of inventory, tools, protective and fire fighting equipment, instructions.
- 6.1.10 For violation of the rules of internal labor regulations and labor discipline.
- 6.1.11 Penalties for production omissions the degree and nature of specific omissions are determined. Regulations about bonuses. Rules of internal labor

regulations of Rules of technical operation, RULES OF SAFETY TECHNIQUE, labor and criminal legislation.

KSt 202-865: 2012

INFORMATIONAL DATA

Developed by the Electric Unit

Head of the unit	M. M. Pulatov
Agreed	
Production and Technical Department	
Head of the department	T. Kh. Soliev
Planning and Economic Department	
Head of the department	F. Kh. Nasirov
Head of the Department of labor safety, safety technique and fire safety	U.
Mavlyanov	
Legal adviser	Sh. Y. Nazarov
Responsible for standardization	N. S. Nurullaeva

COMPANY STANDARD

**JOB DESCRIPTION OF THE CLEANER OF PRODUCTIONAL
PREMISES OF CCPP UNIT**

Open Joint-Stock Company “NTPP”
Navoi

KSt 202- 866:2012

INTRODUCTION

1 DEVELOPED AND INDUCED BY CCPP UNIT OF JSC “NTPP”

2. APPROVED AND ENTRY INTO ACTION BY THE ORDER OF "NTPP"
OJSC
dated _____ No.

3 INTRODUCED FOR THE FIRST TIME

- Indication of PP - 56;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of 12.01.1999 No. 140 "On measures to strengthen the performance discipline";
- The Law of the Republic of Uzbekistan "On Electric Power Industry" No. 225 from 30.09.2009;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 245 dated August 22, 2009 "On approval of the rules for the use of electric and thermal energy";

- "Regulations on the investigation and recording of accidents and other damage to workers' health at work "approved by the Cabinet of Ministers on June 6, 1997;
 - "Safety rules for operation thermal mechanical equipment of power plants and heat networks "in the following volume:
Section 1 subsection 1.2 clauses 1.2.1, 1.2.11, 1.2.12, 1.2.13;
Appendix 2.
 - KSt 202-036: 2007 "Rules of internal labor regulations for employees of OJSC" NTPP ";
 - "Instructions for first aid to victims in connection with accidents in the maintenance of power equipment ";
 - Rules and norms of labor protection, safety precautions, industrial sanitation and fire protection.
- 2.5 The location of the cleaner of the industrial premises installed in the administrative building of the CCGT.
- 2.6 The service area of the cleaner of production premises is the fixed sections of the CCGT.

3 Functions and responsibilities

- 3.1 Cleaning on the Central control room, in the offices of the unit and other production facilities.
- 3.2 Wiping dust from floors, stairs, windows, walls in production areas.
- 3.3 Preparation of various detergents and disinfectant solutions.
- 3.4 Reception and storage of detergents, equipment and wiping material.
- 3.5 Arrangement and removal of garbage from urns, their cleaning and disinfection.
- 3.6 Cleaning and disinfection of toilets.
- 3.7 The cleaner of the production premises should know:
- Requirements of industrial sanitation;
 - Purpose and concentration of disinfectant solutions and detergents;
 - Rules for cleaning in the premises of existing equipment.

4 Rights

- 4.1 Suspend and leave the workplace in case of emergency.
- 4.2 Do not follow instructions that conflict with safety regulations.
- 4.3 Appeal, in case of disagreement with the order or instruction, without suspending their implementation, if they pose a threat to the health or safety of the equipment.
- 4.4 Follow the work schedule, according to KSt 202-036: 2007 "Rules of internal labor regulations for employees of OJSC" NTPP ".

5 Relationships

5.1 Carries out all orders of the unit manager and the deputy head of the unit of the CCGT.

5.2 In case of receiving an order from the director, deputy director or chief engineer, it is carried out and brought to the attention of the deputy head of the CCGT repair department.

6 Responsibility

6.1 The cleaner of the production premises, depending on the degree and nature of the violations, is brought to disciplinary, administrative and other measures of responsibility for failure to perform or improperly performing its functional duties, resulting in accidents and accidents, damage to the employer's property and other adverse consequences, in accordance with the current legislation of the Republic of Uzbekistan.

INFORMATIONAL DATA

Developed by CCPP unit of JSC “NTPP”
Head of unit

I. H. Abdulloev

Agreed

Production and Technical Department
Head of Department

I. S. Murtazaev

Planning and Economic Department
Head of the department

F. R. Khozhieva

Service reliability of machinery and industrial safety
Head of the service

Kh. O. Muminov

Legal adviser

T. A. Toilokov

Responsible for standardization

O. L. Zelenskaya

APPROVED
 Chief Engineer
 JSC "Navoi TPP"
 Nazarov T.G.
 « ____ » _____ 2014

PROGRAM
 for individual training
 for Mechanic of gas turbine equipment at CCPP.

№	TOPICS	Number of hours
1.	Basic information on the production and organization of the workplace. Job description of Mechanic of gas turbine equipment	8
2.	Safety techniques, industrial hygiene and fire safety in the unit of the CCPP. Rules of design and safe operation of vessels, pipelines and gas facilities.	8
3.	Information on heat engineering.	16
4.	Flow sheets of GT, ST, HRSG and auxiliary equipment.	24
5.	Construction and mode of operation of main and auxiliary equipment of GT and HRSG.	32
6.	Commissioning, maintenance and shut-down of main and auxiliary equipment of GT and HRSG. An emergency stop of main and auxiliary equipment of GT and HRSG.	32
7.	Details on electrical engineering. Service and maintenance of GT generator cooling system and generator seal oil system.	16
8.	Methods of economic mode of operation of main and auxiliary equipment of GT and HRSG. Technological protection and blocking of the gas turbine.	24
9	Totally	160

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functionality. Interaction between units. Common auxiliaries. Work place, its organization and technical maintenance. Internal regulations .

TOPIC 2. Safety techniques, industrial hygiene and fire safety in the unit of the CCPP.

Safety techniques. Objectives of safety techniques in production. Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Rules of conduct within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Personal care. Self-help and first aid in case of accidents. Workplace medical and health care.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm. Carbon dioxide fire extinguishers for the premises of GT and gas-control unit, and manuals. Activity indicator of safety extinguisher. Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of boilers, vessels, piping, steam pipe-lines and gas facilities.

TOPIC 3. Information on heat engineering

Basics of Thermal Technology. Calorie as a unit of thermal energy. The mechanical equivalent of heat. Pressure. The physical and technical atmosphere. Depression (vacuum). Saturated and superheated steam. The dependence of the saturation temperature (boiling temperature) on the pressure. Vaporization heat and its dependence on pressure. The heat content of steam and condensate. Turbine and mode of operation.

Thermal insulation, cushioning and stuffing materials.

Types of materials, their brief characteristics and area of use. Dependence of the materials use on operating parameters (pressure and temperature) and the environment (water, steam, oil). Requirements for thermal insulation, cushioning and stuffing materials.

TOPIC 4. Flow sheets of GT and its auxiliary equipment.

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment and accessories of GT. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for Inspection Engineer of gas turbine equipment: A-21083-C, A-21082-C, A-21081-A, A-21067-A, A-21066-C, A-21065-C, A-21064-C, A-21063-C, A-21062-C, A-21061-A, A-21010, A-21084-A, A-21085-A, A-21086-A, A-21087-A, A-21088-A, A-21091-A, A-21091-A, A-21131-A, G1-79857, G1-79858, G1-99992, G1-99993, G1-99994, G1-81331, G1-99996, G1-99997, NAV-10-MB-MDL-MTG-003, NAV-10-MKB-MDD-MEL-352, NAV-10-MKB-MDD-MEL-353, NAV-10-LB-BDD-IEM-020, NAV-10-LB-BDD-IEM-025, NAV-10-LB-BDD-IEM-030, NAV-10-LB-BDD-IEM-035, NAV-10-LA-BDD-IEM-040, NAV-10-LCQ-BDD-IEM-070, NAV-10-PG-BDD-IEM-100, NAV-10-MA-BDD-IEM-110, NAV-10-LAC-MDD-TOR-207, NAV-10-QJ-BDD-IEM-135.

TOPIC 5. Construction and mode of operation of main and auxiliary equipment of GT and HRSG.

Air-intake system of GT (air filters and limits of operation, media evaporator, heat-exchange unit of air boiler), Compressor of GT (AD (air distributor), air bleed for cooling turbine blades, compressor efficiency, pressure and temperature of the incoming and outgoing compressor air, as well as its influence on the GT load). Gas turbine (Rate of blades and their

cooling level, efficiency of the turbine, combustor and cooling system, burners of GT, number of bearings of GT, bypass and anti-surge valves), the exhaust gas system. Lubrication System for GT (characteristics of pump lubrications, oil heating, oil tank, heat exchanger, oil separator, oil for speed increase). The control system for gas valves (regulating oil, electrostatic oil). Fuel gas heater (construction and operating limits). Cooler for cooling air turbine (construction and operating limits). System of blades flushing. Evaporative cooling of the inlet air in compressor. Anti-icing system. System of inlet air heating. Gas distribution unit of GT (control valves for gas flow and pressure, servo motor valves, gas distribution, blow-off valves). The cooling system of the turbine vessel. Instrument Air.

Recovery Boiler (HRSG) (design, performance parameters, operation principles). Range drum, boiler super-heater, economizer, evaporator, safety, regulatory and pre-start valves. Cooling fans for observation windows and flame sensors of HRSG. Drainage system, periodic and continuous blowing down of drums and low points of HRSG. Conservation of HRSG during the repair period. The circulation of water in HRSG. Steam parameters and performance of HRSG. Duct burners of HRSG. The properties and composition of natural gas.

TOPIC 6. Commission and shut-down of main and auxiliary equipment of GT and HRSG.
An emergency shut-down of auxiliary equipment of HRSG and GT.

The preparation procedures for launching of CCPP. The order of start-up of auxiliary equipment of GT and HRSG step-by-step (lubrication system, control system, fans for GT premises and gas distribution point/unit, preparing Static Frequency Converter (SFC), inspection of foreign objects in the area of the turbine and gas distribution point, cooling fans for observation windows and flame sensors, etc.). Prepare HRSG for the launching (filling HRSG hookups with water, starting modes, draining of the condensate remain from the steam superheaters).

Chemical mode of recovery boiler.. Saving fuel, heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 7. Details of electrical engineering. Service and maintenance of GT generator cooling system and generator seal oil system.

Characteristics of GT generator (rated power, current, voltage, temperature of the cooling water). Normal and emergency operation modes of the generator. Generator cooling scheme. Valid parameters of generator cooling and facilities for direct regulation of cooling. Device for oil supply for generator seals. Regulation of the oil supply to the seals. Boundary parameters for oil supplied to the generator seals. Generator load depending on the type and temperature of the coolant temperature.

The auxiliary circuit for 6 kV and 0.4 kV station. Synchronization and hook up generators into electrical network. Load shedding of generator. The concept of the alarm signaling for equipment at unit switchboard. First aid measures for electric shock. Fire extinguishing in electrical installations.

TOPIC 8. Methods of economic mode of operation of main and auxiliary equipment of GT and HRSG. Technological protection and blocking of the gas turbine.

Mode of operation of heaters and coolers. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Function and operational procedures. Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment on operation efficiency. Automatic control of level, burning, feeding, their function, the principle of operation. Technological protection and blocking of main and auxiliary equipment.

Head of department of CCPP

Abdulloev I.H.

Chief Process Engineer of CCPP

Musaev A.B.

APPROVED
Chief Engineer
JSC "Navoi TPP"

Nazarov T.G.
« ____ » _____ 2014

PROGRAM
of individual training
for Inspection Engineer on Boiler Equipment at CCPP

№	TOPICS	Number of hours
1.	Basic information on the production and organization of the workplace. Job Description of Inspection Engineer on Boiler Equipment.	8
2.	Safety techniques, industrial hygiene and fire safety in the unit of the CCPP. Rules of design and safe operation of vessels, pipelines and gas facilities.	8
3.	Information on heat engineering.	16
4.	Flow sheets of HRSG and auxiliary equipment.	24
5.	Construction and mode of operation of the main and auxiliary equipment of HRSG.	32
6.	Commissioning, maintenance and shut-down of HRSG and auxiliary equipment of HRSG. An emergency stop of main and auxiliary equipment of HRSG.	32
7.	Methods of economic mode of operation of the main and auxiliary equipment of HRSG and auxiliary equipment of GT and HRSG. Technological protection and blocking of gas turbine.	24
8.	Totally	144

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functionality. Interaction between units. Common auxiliaries. Work place, its organization and technical maintenance. Internal regulations.

TOPIC 2. Safety techniques, industrial hygiene and fire safety in the unit of the CCPP.

Safety techniques. Objectives of safety techniques in production. Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Rules of conduct within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Personal care. Self-help and first aid in case of accidents.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm.

Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of boilers, vessels, piping, steam pipe-lines and gas facilities.

TOPIC 3. Information on heat engineering.

Basics of thermal technology. Calorie as a unit of thermal energy. Mechanical equivalent of heat. Pressure. Physical and technical atmosphere. Depression (vacuum). Saturated and superheated steam. The dependence of the saturation temperature (boiling temperature) on the pressure. Vaporization heat and its dependence on pressure. The heat content of steam and condensate. Turbine and mode of operation. Recovery boiler and mode of operation. Thermal insulation, cushioning and stuffing materials.

Types of materials, their brief characteristics and area of use. Dependence of the materials use on operating parameters (pressure and temperature) and the environment (water, steam, oil). Requirements for thermal insulation, cushioning and stuffing materials.

TOPIC 4. Flow sheets of HRSG and auxiliary equipment.

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment and accessories of GT. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for Inspection Engineer: NAV-10-LB-BDD-IEM-020, NAV-10-LB-BDD-IEM-025, NAV-10-LB-BDD-IEM-030, NAV-10-LBD-BDD-IEM-035, NAV-10-LA-BDD-IEM-040, NAV-10-LCQ-BDD-IEM-070, NAV-10-PG-BDD-IEM-100, NAV-10-MA-BDD-IEM-110, NAV-10-LAC-MDD-TOR-207, NAV-10-QJ-BDD-IEM-135.

TOPIC 5. Construction and mode of operation of the main and auxiliary equipment of HRSG.

Instrumentation Air. Recovery Boiler (HRSG) (design, performance parameters, operation principles). Range drum, boiler super-heater, economizer, evaporator, safety, regulatory and pre-start valves. Cooling fans for observation windows and flame sensors of HRSG. Drainage system, periodic and continuous blowing down of drums and low points of HRSG. Conservation of HRSG during the repair period. The circulation of water in HRSG. Steam parameters and performance of HRSG. Duct burners of HRSG. The properties and composition of natural gas.

TOPIC 6. Commissioning, maintenance and shut-down of HRSG and auxiliary equipment of HRSG. An emergency stop of main and auxiliary equipment of HRSG.

The preparation procedures for launching of CCPP. The order of start-up of auxiliary equipment of HRSG step-by-step (drums for feed water, feeding pump of high, medium and low pressure, cooling fans cooling fans for observation windows and flame sensors, etc.). Prepare HRSG for the launching (filling HRSG hookups with water, starting modes, draining of the condensate remain from the steam superheaters). Chemical mode of recovery boiler. Saving fuel, heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 7. Methods of economic mode of operation of the main and auxiliary equipment of HRSG and auxiliary equipment of GT and HRSG.

Technological protection and blocking of gas turbine. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Function and operational procedures. Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment of turbine on operation efficiency. Automatic control of level, burning, feeding, their function, the principle of operation. Technological protection and blocking of main and auxiliary equipment.

Head of department of CCPP

Abdulloev I.H.

Chief Production Engineer of CCPP

Musaev A.B.

APPROVED
Chief Engineer
JSC "Navoi TPP"
Nazarov T.G.
«__»____2014

PROGRAM
of individual training
for Inspection Engineer on ST at CCPP

№	TOPICS	Number of hours
1.	Basic information on the production and organization of the workplace. Job Description of operator of ST.	8
2.	Safety techniques, industrial hygiene and fire safety in the unit of the CCPP. Rules of design and safe operation of vessels, pipelines and gas facilities.	8
3.	Information on heat engineering.	16
4.	Flow sheets of ST and auxiliary equipment at CCPP.	24
5.	Construction and mode of operation of the main and auxiliary equipment of ST and auxiliary equipment at CCPP.	32
6.	Commissioning, maintenance and shut-down of the main and auxiliary equipment of ST and auxiliary equipment at CCPP. An emergency stop of the main and auxiliary equipment of ST and auxiliary equipment at CCPP.	32
7.	Details of electrical engineering. Maintenance of generator's cooling system of ST	16
8.	Methods of economic mode of operation of the main and auxiliary equipment of ST and auxiliary equipment at CCPP. Technological protection and blocking of steam turbine.	24
9	Totally	160

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functionality. Interaction between units. Common auxiliaries. Work place, its organization and technical maintenance. Internal regulations.

TOPIC 2. Safety techniques, industrial hygiene and fire safety in the unit of the CCPP.

Safety techniques. Objectives of safety techniques in production. Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Behavior rules within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Personal care. Self-help and first aid in case of accidents.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm. Carbon dioxide fire extinguishers for the premises of GT and gas-control unit, and manuals. Activity indicator of safety extinguisher.

Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of boilers, vessels, piping, steam pipe-lines and gas facilities.

TOPIC 3. Information on heat engineering.

Basics of thermal technology. Calorie as a unit of thermal energy. Mechanical equivalent of heat. Pressure. Physical and technical atmosphere. Depression (vacuum). Saturated and superheated steam. The dependence of the saturation temperature (boiling temperature) on the pressure. Vaporization heat and its dependence on pressure. The heat content of steam and condensate. Turbine and mode of operation. Recovery boiler and mode of operation. Thermal insulation, cushioning and stuffing materials.

Types of materials, their brief characteristics and area of use. Dependence of the materials use on operating parameters (pressure and temperature) and the environment (water, steam, oil). Requirements for thermal insulation, cushioning and stuffing materials.

TOPIC 4. Flow sheets of ST and auxiliary equipment at CCPP.

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment of ST and auxiliary equipment at CCPP. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for the Inspection Engineer of ST: NAV-10-MA-MDM-MN-001, NAV-10-MA-MDM-MN-002, NAV-10-MA-MDD-MN-005, NAV-10-MA-MDD-MN-006, NAV-10-MA-MDD-MN-010, NAV-10-MA-MDD-MN-011, NAV-10-MA-MDD-MN-008, NAV-10-MA-MDD-MN-013, NAV-10-MA-MDL-MN-605, NAV-10-LB-BDD-IEM-010, NAV-10-NA-BDD-IEM-015, NAV-10-LC-BDD-IEM-045, NAV-10-MAW-BDD-IEM-055, NAV-10-MAL-BDD-IEM-060, NAV-10-LCQ-BDD-IEM-070, NAV-10-PA-BDD-IEM-080, NAV-10-LFN-BDD-IEM-085, NAV-10-PAH-MDD-GEA-001, NAV-10-GC-BDD-IEM-155, NAV-10-GHC-BDD-IEM-170, NAV-10-GM-BDD-IEM-175, NAV-10-MAJ-BDD-IEM-250, NAV-10-QUA-BDD-IEM-701, NAV-10-MAJ-MDD-NAS-001, NAV-10-EK-MDD-ENI-001/002/003/004, NAV-10-LCP-BDD-IEM-095, NAV-10-PG-BDD-IEM-100, NAV-10-MA-

BDD-IEM-110, NAV-10-QE-BDD-IEM-120, NAV-10-QE-BDD-IEM-125, NAV-10-QE-BDD-IEM-702, NAV-10-SG-BDD-IEM-130,

TOPIC 5. Construction and mode of operation of the main and auxiliary equipment of ST and auxiliary equipment at CCPP.

Steam turbine (construction, performance parameters, regulatory and shut-off valves, the number of bearings). Supply systems of lubricating and control oil (parameters of high, low and emergency oil pumps, servomotors of steam valves, parameters of main oil pump (MOP), oiling system of an automatic stopping). Turbine steam sealing system (steam extraction for sealing, sealing steam condenser, seal types, sealing steam performance parameters). Normal operation of the turbine (temperature and vibration bearings, Relative Rotor Expansion (RRE), the absolute expansion of the turbine, rotor axis, etc.). Electro-hydraulic converter. Drainage system. Irrigation system for Low-Pressure Cylinder (LPC)'s exhaust, air-cooling system of the turbine. Temperature monitoring of the turbine.

The main steaming line. The condenser and condensate pumps, their devices and functionality. Feeding pump. Heating unit, its structure and purpose. Gas distribution and measuring unit of CCPP (RMS). Vacuum pumps, closed cooling system, auxiliary cooling pumps, water circulation system (circulation pumps, water cooling, cooling tower, cooling fans). Condensed steam and circulation water feeding system, demineralized water system. Instrument Air. Drainage system of steam pipelines and turbine.

TOPIC 6. Commissioning, maintenance and shut-down of the main and auxiliary equipment of ST and auxiliary equipment at CCPP. An emergency stop of the main and auxiliary equipment of ST and auxiliary equipment at CCPP.

The procedure of preparation for the launch of CCPP. The order of start-up of auxiliary equipment step-by-step (water circulation system, auxiliary cooling system, closed cooling system, etc.). Preparations for ST start-up (preparation of the permitted limits for start-up, preparation of auxiliary equipment of ST).

Lubrication system. The system of regulation. Starting modes for ST, specifications of start-up turbine under hot conditions. Chemical steam mode. Detection of foreign objects in the area of the turbine. Synchronization of generator with system. Sealing process of steam turbine and a vacuum creation in the condenser. Increasing the load to the nominal value depending on the load of GT and vacuum condenser. Normal mode of shutting down of ST.

Saving fuel, heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation rules of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 7. Details of electrical engineering. Maintenance of generator cooling system of ST.

Characteristics of the generator of ST (nominal-rated capacity, current, voltage, temperature of the cooling water). Normal and emergency operation modes of the generator. Generator cooling scheme. Valid parameters of generator cooling and objects of direct cooling control. Generator capacity depending on the type and temperature of the cooling medium. The auxiliary circuit for 6 kV and 0.4 kV station. Synchronization and hook up generators into electrical network. First aid measures for electric shock. Fire extinguishing at electrical installations.

TOPIC 8. Methods of economic mode of operation of the main and auxiliary equipment of ST and auxiliary equipment at CCPP. Technological protection and blocking of steam turbine.

Mode of operation of heaters and coolers. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment of turbine on operation efficiency. Automatic control of level, burning, feeding, their function, the principle of operation. Technological protection and blocking of main and auxiliary equipment of ST and auxiliary equipment at CCPP.

Head of department of CCPP

Abdulloev I.H.

Chief Process Engineer of CCPP

Musaev A.B.

APPROVED
Chief Engineer
JSC "Navoi TPP"
Nazarov T.G.
«__»____2014

PROGRAM
of individual training
for Operator of ST

№	TOPICS	Number of hours
1.	Basic information on the production and organization of the workplace. Job Description of Operator of ST.	8
2.	Safety techniques, industrial hygiene and fire safety in the unit of the CCPP. Rules of design and safe operation of vessels, pipelines and gas facilities.	16
3.	Flow sheets of ST and its auxiliary equipment.	24
4.	Construction and mode of operation of the main and auxiliary equipment of ST.	32
5.	Commissioning, maintenance and shut-down of the main and auxiliary equipment of ST. An emergency stop of the main and auxiliary equipment of ST.	32
6.	Details of electrical engineering. Maintenance of generator cooling system of ST.	16
7.	APCS, technological protection and blocking of steam turbine.	24
8.	Methods of economic mode of operation of the main and auxiliary equipment of ST.	8
9	Totally	160

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functionality. Interaction between units. Common auxiliaries. Work place, its organization and technical maintenance. Internal regulations.

TOPIC 2. Safety techniques, industrial hygiene and fire safety in the unit of the CCPP.

Safety techniques. Objectives of safety techniques in production. Legislation and regulatory bodies for the labor safety in the Republic of Uzbekistan.

Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Rules of conduct within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Basic preventive and protective measures. Personal care. Self-help and first aid in case of accidents. Workplace medical and health care.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm. Carbon dioxide fire extinguishers for the premises of GT and gas-control unit, and manuals. Activity indicator of safety extinguisher.

Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of vessels, piping, and steam pipe-lines.

TOPIC 3. Flow sheets of ST and its auxiliary equipment.

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment and accessories of ST and auxiliary equipment at CCPP. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for the Operator of ST: NAV-10-MA-MDM-MN-001, NAV-10-MA-MDM-MN-002, NAV-10-MA-MDD-MN-005, NAV-10-MA-MDD-MN-006, NAV-10-MA-MDD-MN-010, NAV-10-MA-MDD-MN-011, NAV-10-MA-MDD-MN-008, NAV-10-MA-MDD-MN-013, NAV-10-MA-MDL-MN-605, NAV-10-MAJ-MDD-NAS-001, NAV-10-QUA-BDD-IEM-701, NAV-10-MAJ-BDD-IEM-001, NAV-10-SG-BDD-IEM-130, NAV-10-PG-BDD-IEM-100, NAV-10-PA-BDD-IEM-080, NAV-10-LCQ-BDD-IEM-070, NAV-10-MAL-BDD-IEM-060, NAV-10-MAW-BDD-IEM-055, NAV-10-LB-BDD-IEM-010, NAV-10-V-BDD-IEM-001.

TOPIC 4. Construction and mode of operation of the main and auxiliary equipment of ST.

Steam turbine (construction, performance parameters, regulatory and shut-off valves, the number of bearings). Supply systems of lubricating and control oil (parameters of high, low and emergency oil pumps, servomotors of steam valves, parameters of main oil pump (MOP), oiling system of an automatic stopping). Turbine steam sealing system (steam extraction for sealing, sealing steam condenser, seal types, sealing steam performance parameters). Normal operation of the turbine (temperature and vibration bearings, Relative Rotor Expansion (RRE), the absolute expansion of the turbine, rotor axis, etc.) Electro-hydraulic converter. Drainage system. Irrigation system for Low-Pressure Cylinder (LPC)'s exhaust, air-cooling system of the turbine. Temperature monitoring of the turbine.

TOPIC 5. Commissioning, maintenance and shut-down of the main and auxiliary equipment of ST. An emergency stop of the main and auxiliary equipment of ST.

Preparations for ST start-up and start-up (preparation of the permitted limits for start-up, preparation of auxiliary equipment of ST).

Lubrication system. The system of regulation. Starting modes for ST, specifications of start-up turbine under hot conditions. Chemical steam mode. Detection of foreign objects in the area of the turbine. Synchronization of generator with system.

Increasing the load to the nominal value depending on the load of GT and vacuum condenser. The interaction between the operators of ST and auxiliary equipment during start-up. Normal mode of shutting down of ST.

Saving heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 6. Details of electrical engineering. Maintenance of generator cooling system of ST.

Characteristics of the generator of ST (nominal-rated capacity, current, voltage, temperature of the cooling water). Normal and emergency operation modes of the generator. Generator cooling scheme. Valid parameters of generator cooling and objects of direct cooling control. Generator capacity depending on the type and temperature of the cooling medium.

The auxiliary circuit for 6 kV and 0.4 kV station. Synchronization and hook up generators into electrical network. Emergency unloading generator. The concept of electrical signaling in the control room. First aid measures for electric shock. Fire extinguishing in electrical installations.

TOPIC 7. APCS, technological protection and blocking of steam turbine.

Software APCS of steam turbine. Control logics. Brief description of "DAISYSNETMATION" program. Automatic controls of level, flow, pressure, power; their functions and concept of operation. Technological protection and blocking of main and auxiliary equipment.

TOPIC 8. Methods of economic mode of operation of the main and auxiliary equipment of ST.

Mode of operation of heaters and coolers. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment of turbine on operation efficiency.

Head of department of CCPP

Abdulloev I.H.

Chief Production Engineer of CCPP

Musaev A.B.

Chief Engineer
JSC "Navoi TPP"
Nazarov T.G.
«__»____2015

PROGRAM
for individual training
for Shift-Head of Unit of CCPP.

№	TOPICS	Number of days
1.	Basic information on the production and organization of the workplace.	1
2.	Safety, industrial hygiene and fire safety at CCPP unit.	5
3.	Flow sheets for Steam Turbine (ST), HRSG, gas turbine (GT) and auxiliary equipment at CCPP and GBS (Gas Boosting Station).	4
4.	Construction and mode of operation of main and auxiliary equipment at CCPP and GBS, main and auxiliary equipment of GT, the main and auxiliary equipment of ST.	2
5.	Commission and shut-down of HRSG, ST, GT and auxiliary equipment at CCPP and GBS. An emergency shut-down of HRSG and auxiliary equipment at CCPP.	7
6.	Chemical mode of the main and auxiliary equipment at CCPP.	10
7.	Details of electrical engineering.	2
8.	APCS, technological protection and blocking of auxiliary equipment at CCPP.	3
9.	Methods of economic mode of operation of main and auxiliary equipment of GT	4
	TOTALLY	42

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functions. Interaction between units. common auxiliaries. Workplace, its organization and maintenance operations. Internal regulations.

TOPIC 2. Safety techniques, industrial hygiene and fire-safety measures for CCPP unit.

Safety techniques. Objectives of safety techniques in production. Legislation and regulatory bodies for the labor safety in the Republic of Uzbekistan.

Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Rules of conduct within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Basic preventive and protective measures. Personal care. Self-help and first aid in case of accidents. Workplace medical and health care.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm. Carbon dioxide fire extinguishers for the premises of GT and gas-control unit, and manuals. Activity indicator of safety extinguisher. Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of vessels, piping, steam pipe-lines and gas facilities.

TOPIC 3. Flow sheets for Steam Turbine (ST), Heat Recovery Steam Generator (HRSG), gas turbine (GT) and auxiliary equipment at CCPP and GBS (Gas Boosting Station).

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment and accessories of ST and auxiliary equipment of CCPP. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for Chief mechanic of CCPP: A-21010, A-21061-A, A-21062-C, A-21083-C, G1-99992, G1-99997, A-21063-C, A-21064-C, A-21065-C, A-21066-C, A-21067-A, A-21081-A, A-21082-C, A-21084-A, A-21085-A, A-21086-A, A-21087-A, A-21088-A, A-21091-A, A-21091-A, A-21131-A, G1-79857, G1-79858, G1-81331, G1-99993, G1-99994, G1-99996, NAV-10-EK-MDD-ENI-001/002/003/004, NAV-10-GC-BDD-IEM-155, NAV-10-GHC-BDD-IEM-170, NAV-10-GM-BDD-IEM-175, NAV-10-HA-MDD-NEI-001, NAV-10-LA-BDD-IEM-040, NAV-10-LAC-MDD-TOR-207, NAV-10-LB-BDD-IEM-010, NAV-10-LB-BDD-IEM-010, NAV-10-LB-BDD-IEM-020, NAV-10-LB-BDD-IEM-025, NAV-10-LB-BDD-IEM-030, NAV-10-LBD-BDD-IEM-035, NAV-10-LC-BDD-IEM-045, NAV-10-LCP-BDD-IEM-095, NAV-10-LCQ-BDD-IEM-070, NAV-10-LCQ-BDD-IEM-070, NAV-10-LCQ-BDD-IEM-075, NAV-10-LFN-BDD-IEM-085, NAV-10-MA-BDD-IEM-110, NAV-10-MAJ-BDD-IEM-001, NAV-10-MAJ-BDD-IEM-250, NAV-10-MAJ-MDD-NAS-001, NAV-10-MAJ-MDD-NAS-001, NAV-10-MAL-BDD-IEM-060, NAV-10-MAL-BDD-IEM-060, NAV-10-MA-MDD-MN-005, NAV-10-MA-MDD-MN-006, NAV-10-MA-MDD-MN-008, NAV-10-MA-MDD-MN-010, NAV-10-MA-MDD-MN-011, NAV-10-MA-MDD-MN-013, NAV-10-MA-MDL-MN-605, NAV-10-MA-MDM-MN-001, NAV-10-MA-MDM-MN-002, NAV-10-MAW-BDD-IEM-055, NAV-10-MAW-BDD-IEM-055, NAV-10-MB-MDL-MTG-003, NAV-10-MKB-MDD-MEL-352, NAV-10-MKB-MDD-MEL-353, NAV-10-NA-BDD-IEM-015, NAV-10-PA-BDD-IEM-080, NAV-10-PA-BDD-IEM-080, NAV-10-PAH-MDD-GEA-001, NAV-10-PG-BDD-IEM-100, NAV-10-PG-BDD-IEM-100, NAV-10-QE-BDD-IEM-120, NAV-10-QE-BDD-IEM-125, NAV-10-QE-BDD-IEM-702, NAV-10-QUA-BDD-IEM-701, NAV-10-QUA-BDD-IEM-701, NAV-10-SA-BDD-IEM-140, NAV-10-SG-BDD-IEM-130, NAV-10-SG-BDD-IEM-130, NAV-10-V-BDD-IEM-001, NAV-10-V-BDD-IEM-001, 032-BCS-PID-001(1-9 pages), 032- BCS -PID-002, 032-BCS -PID-003(1-4 pages), 032- BCS -PID-L&S.

TOPIC 4. Construction and mode of operation of main and auxiliary equipment at CCPP and GBS, main and auxiliary equipment of GT, the main and auxiliary equipment of ST.

HRSG (design, performance parameters, operation principles). Range drum, boiler super-heater, economizer, evaporator, safety, regulatory and pre-start valves. Cooling fans for observation windows and flame sensors of HRSG. Drainage system, periodic and continuous blowing down of drums and low points of HRSG. Conservation of HRSG during the repair period. The circulation of water in HRSG. Steam parameters and performance of HRSG. Duct burners of HRSG. Gas and steam turbine facilities. The main part of the gas and steam turbine

facilities, their purpose, the device interaction. The main steaming line. The condenser and condensate pumps, their devices and functionality. Feeding pump. Heating unit, its structure and purpose. Gas distribution and measuring unit of CCPP (RMS). Vacuum pumps, closed cooling system, auxiliary cooling pumps, water circulation system (circulation pumps, water cooling, cooling tower, cooling fans). Condensed steam and circulation water feeding system, demineralized water system. Instrument Air. Drainage system of steam pipelines and turbine.

Air-intake system of GT (air filters and limits of operation, media evaporator, heat-exchange unit of air boiler), Compressor of GT (AD (air distributor), air bleed for cooling turbine blades, compressor efficiency, pressure and temperature of the incoming and outgoing compressor air, as well as its influence on the GT load). Gas turbine (Rate of blades and their cooling level, efficiency of the turbine, combustor and cooling system, burners of GT, number of bearings of GT, bypass and anti-surge valves), the exhaust gas system. Lubrication System for GT (characteristics of pump lubrications, oil heating, oil tank, heat exchanger, oil separator, oil for speed increase). The control system for gas valves (regulating oil, electrostatic oil). Fuel gas heater (construction and operating limits). Cooler for cooling air turbine (construction and operating limits). System of blades flushing. Evaporative cooling of the inlet air in compressor. Anti-icing system. System of inlet air heating. Gas distribution unit of GT (control valves for gas flow and pressure, servo motor valves, gas distribution, blow-off valves). The cooling system of the turbine vessel. Instrument Air.

Steam turbine (construction, performance parameters, regulatory and shut-off valves, the number of bearings). Oil supply and control system (parameters of high, low and emergency oil pumps, servomotors of steam valves, parameters of main oil pump (MOP), oiling system of an automatic stopping). Turbine steam sealing system (steam extraction for sealing, sealing steam condenser, seal types, sealing steam performance parameters). Normal operation of the turbine (temperature and vibration bearings, Relative Rotor Expansion (RRE), the absolute expansion of the turbine, rotor axis, etc.) Electro-hydraulic converter. Drainage system. Irrigation system for Low-Pressure Cylinder (LPC)'s exhaust, air-cooling system of the turbine. Temperature monitoring of the turbine.

Gas booster compressor (construction, performance, regulatory and shut-off valves, the number of bearings). Input dust collector, filter separator, compressor unit CU-100/200, the compressor C-101/201, Gas Air Cooling Unit and gas separator, Compressors' Dry Gas Seals Unit (DGSU), oil system, compressor of compressed air, Receivers, separator F-501A/B, air dehumidifiers unit.

TOPIC 5. Commission and shut-down of HRSG, ST, GT and auxiliary equipment at CCPP and GBS. An emergency shut-down of HRSG and auxiliary equipment at CCPP.

The procedure of preparation for the launch of CCPP. The order of start-up of auxiliary equipment step-by-step (water circulation system, auxiliary cooling system, closed cooling system, etc.). Preparations for HRSG start-up (water-filling of HRSG hookups, modes of start-up for HRSG, the drain of condensate remainder from the super-heater). Chemical mode of HRSG. Sealing process of steam turbine and a vacuum creation in the condenser.

The procedure of preparation for commissioning and start-up of GT (prepare the permitted limits for start-up, preparing Static Frequency Converter (SFC), lubrication system, control system, generator sealing system, preparing auxiliary equipment of GT, detection of foreign objects/restrictions in the area of the turbine and gas distribution unit). Synchronization of generator system. Increasing the load to the nominal value. The interaction between the operators of ST and auxiliary equipment during increase of load. Normal mode of shutting down GT.

The procedure of preparation for commissioning and start-up of GT (load increasing, preparing auxiliary equipment of GT). Lubrication system. The system of regulation. Starting modes for ST, specifications of start-up turbine under hot conditions. Chemical steam mode. Detection of foreign objects in the area of the turbine. Synchronization generator system. Increasing the load to the nominal value depending on the load of GT and vacuum capacitor. The interaction between the operators of ST and auxiliary equipment during start-up. Normal mode of shutting down of ST.

The procedure of preparation for commissioning and start-up of electrical hot-air heater (EHH 100/200) (prepare the permitted limits for start-up, preparing auxiliary equipment of BBS). Lubrication system. System of regulation. Compressors start-up modes. Detection of foreign objects in the area of the turbine. Soft-start of synchronous motor, increasing the pressure to the nominal value depending on the interaction between operators of BBS and driver-lineman during the commissioning. Normal mode of shutting down of compressor.

Saving fuel, heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 6. Chemical mode of the main and auxiliary equipment at CCPP.

Requirements for the quality of steam. Causes of impurities ingress into steam. Norms of boiler water salinity level. Solubility of salts in saturated steam, superheated steam, boiler water. Phosphatization: purpose and scheme. Application of hydrazine. Quality of demineralized water and condensate. Requirements for the feeding water. Causes of the chemical mode disturbances of HRSG and steam turbine, condenser, drums and action to eliminate them. Safety Technique (ST) instructions for maintenance of phosphate and hydrazine pumps. Chemical analysis of the closed cooling system.

TOPIC 7. Details of electrical engineering.

The auxiliary circuit for 6 kV and 0.4 kV station. Synchronization and hook up generators into electrical network. Load shedding of generator. The concept of the alarm signaling for equipment at unit switchboard. First aid measures for electric shock. Fire extinguishing in electrical installations.

TOPIC 8. APCS, technological protection and blocking of auxiliary equipment at CCPP.

Software APCS accessories for auxiliary equipment at CCPP and GBS. Control logics. Brief description of "ABBAC 800 M" and "DAISYSNETMATION" programs. Automatic controls of level, flow, pressure, power; their functions and concept of operation. Technological protection and blocking for main and auxiliary equipment.

TOPIC 9. Methods of economic mode of operation of main and auxiliary equipment of GT.

Mode of operation of heaters and coolers. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Function and operational procedures. Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment on operation efficiency.

Head of department of CCPP

Abdulloev I.H.

Chief Process Engineer of CCPP

Musaev A.B.

APPROVED
Chief Engineer
JSC "Navoi TPP"

Nazarov T.G.
« ____ » _____ 2014

PROGRAM
of individual training
for Auxiliary Equipment (AE) Operator.(BOP)

№	TOPICS	Number of hours
1.	Basic information on the production and organization of the workplace. Job Description of AE operator	8
2.	Safety techniques, industrial hygiene and fire safety in the unit of the CCPP. Rules of design and safe operation of vessels, pipelines and gas facilities.	16
3.	Flow sheets of GT, ST, HRSG and auxiliary equipment of CCPP	24
4.	Construction and mode of operation of main and auxiliary equipment of CCPP	32
5.	Commissioning, maintenance and shut-down of HRSG and auxiliary equipment at CCPP. An emergency stop of HRSG and auxiliary equipment at CCPP.	32
6	Chemical mode of main and auxiliary equipment at CCPP.	8
7.	Details on electrical engineering.	8
8.	APCS, technological protection and blocking of HRSG and auxiliary equipment at CCPP.	24
9.	Methods of economic mode of operation of the main and auxiliary equipment of HRSG and auxiliary equipment at CCPP.	8
10	Totally	160

TOPIC 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. Main and auxiliary power plant units, their functionality. Interaction between units. Common auxiliaries. Work place, its organization and technical maintenance. Internal regulations .

TOPIC 2. Safety techniques, industrial hygiene and fire safety in the unit of the CCPP.

Safety techniques. Objectives of safety techniques in production. Legislation and regulatory bodies for the labor safety in the Republic of Uzbekistan.

Safety measures within the territory and units of the power plant. Safety regulations for thermal power plants within the requirements of the job description. Rules of conduct within the territory and units of the power plant. Safety regulations for the operation of industrial computers.

Industrial hygiene. Objectives of industrial hygiene. Occupational diseases and their underlying causes. Prevention of occupational diseases.

Basic preventive and protective measures. Personal care. Self-help and first aid in case of accidents. Workplace medical and health care.

Fire-fighting measures. The main causes of fires in the workplace and on the territory of the plant. Inadmissibility of the use of open fire. Fire control stations, fire protection, fire-prevention appliances, devices and alarm. Carbon dioxide fire extinguishers for the premises of GT and gas-control unit, and manuals. Activity indicator of safety extinguisher. Rules of conduct in flammable areas and during the fire. Rules of organization and safe operation of vessels, piping, steam pipe-lines and gas facilities.

TOPIC 3. Flow sheets for Steam Turbine (ST), Recovery Boiler (HRSG) and auxiliary equipment at CCPP.

The concept of flow sheets. Conventional notation of hookups in the sheets. Technology (PI & D) sheets for the main and auxiliary equipment and accessories of ST and auxiliary equipment of CCPP. Assembly drawing and use. Exercises for reading sheets based on studying sheet. Necessary sheets for Auxiliary Equipment (AE) Operator of CCPP: NAV-10-V-BDD-IEM-001, NAV-10-LB-BDD-IEM-010, NAV-10-NA-BDD-IEM-015, NAV-10-LB-BDD-IEM-020, NAV-10-LB-BDD-IEM-025, NAV-10-LB-BDD-IEM-030, NAV-10-LBD-BDD-IEM-035, NAV-10-LA-BDD-IEM-040, NAV-10-LC-BDD-IEM-045, NAV-10-MAW-BDD-IEM-055, NAV-10-MAL-BDD-IEM-060, NAV-10-LCQ-BDD-IEM-070, NAV-10-LCQ-BDD-IEM-075, NAV-10-PA-BDD-IEM-080, NAV-10-LFN-BDD-IEM-085, NAV-10-LCP-BDD-IEM-095, NAV-10-PG-BDD-IEM-100, NAV-10-MA-BDD-IEM-110, NAV-10-QE-BDD-IEM-120, NAV-10-QE-BDD-IEM-125, NAV-10-QE-BDD-IEM-702, NAV-10-SG-BDD-IEM-130, NAV-10-SA-BDD-IEM-140, NAV-10-GC-BDD-IEM-155, NAV-10-GHC-BDD-IEM-170, NAV-10-GM-BDD-IEM-175, NAV-10-MAJ-BDD-IEM-250, NAV-10-QUA-BDD-IEM-701, NAV-10-MAJ-MDD-NAS-001, NAV-10-LAC-MDD-TOR-207, NAV-10-EK-MDD-ENI-001/002/003/004, NAV-10-PAH-MDD-GEA-001, NAV-10-HA-MDD-NEI-001÷015

TOPIC 4. Construction and mode of operation of main and auxiliary equipment at CCPP.

Recovery Boiler (HRSG) (design, performance parameters, operation principles). Range drum, boiler super-heater, economizer, evaporator, safety, regulatory and pre-start valves. Cooling fans for observation windows and flame sensors of HRSG. Drainage system, periodic and continuous blowing down of drums and low points of HRSG. Conservation of HRSG during the repair period. The circulation of water in HRSG. Steam parameters and performance of HRSG. Duct burners of HRSG. Gas and steam turbine facilities. The main part of the gas and steam turbine facilities, their purpose, the device interaction. The main steaming line. The condenser and condensate pumps, their devices and functionality. Feeding pump. Heating unit, its structure and purpose. Gas distribution and measuring unit of CCPP (RMS). Vacuum pumps, closed cooling system, auxiliary cooling pumps, water circulation system (circulation pumps, water cooling, cooling tower, cooling fans). Condensed steam and circulation water feeding system, dematerialized water system. Instrument Air. Drainage system of steam pipelines and turbine.

TOPIC 5. Commission and shut-down of HRSG and auxiliary equipment at CCPP. An emergency shut-down of HRSG and auxiliary equipment at CCPP.

The procedure of preparation for the launch of CCPP. The order of start-up of auxiliary equipment step-by-step (water circulation system, auxiliary cooling system, closed cooling system, etc.). Preparations for HRSG start-up (water-filling of HRSG hookups, modes of start-up for HRSG, the drain of condensate remainder from the super-heater). Chemical mode of recovery boiler. Sealing process of steam turbine and a vacuum creation in the condenser.

Saving fuel, heat and electricity. Decommissioning of equipment for repair. Causes and symptoms of emergencies and measures for their elimination and prevention. Personnel responsibility for permitted accidents and defects. Classification of accidents and defects. The technical operation of main and auxiliary equipment, industrial and emergency response instructions. Specifications of thermal and mechanical equipment plant operation in winter conditions.

TOPIC 6. Chemical mode of the main and auxiliary equipment at CCPP.

Requirements for the quality of steam. Causes of impurities ingress into steam. Norms of boiler water salinity level. Solubility of salts in saturated steam, superheated steam, boiler water. Phosphatization: purpose and scheme. Application of hydrazine. Quality of demineralized water and condensate. Requirements for the feeding water. Causes of the chemical mode disturbances of HRSG, condenser, drums and action to eliminate them. Safety Technique (ST) instructions for maintenance of phosphate and hydrazine pumps. Chemical analysis of the closed cooling system.

TOPIC 7. Details of electrical engineering.

The auxiliary circuit for 6 kV and 0.4 kV station. Synchronization and hook up generators into electrical network. Load shedding of generator. The concept of the alarm signaling for equipment at unit switchboard. First aid measures for electric shock. Putting out a fire in electrical installations.

TOPIC 8. APCS, technological protection and blocking of auxiliary equipment at CCPP.

Software APCS accessories for auxiliary equipment at CCPP and GBS. Control logic. Brief description of "ABBAC 800 M" program. Automatic controls of level, flow, pressure, power; their functions and concept of operation. Technological protection and blocking for main and auxiliary equipment.

TOPIC 9. Methods of economic mode of operation of main and auxiliary equipment of GT.

Mode of operation of heaters and coolers. Technological protection, blocking and automatic transfer circuit-breaker (ATCB). Function and operational procedures. Service and maintenance. Influence of operational indicators of work and technological parameters of the main and auxiliary equipment on operation efficiency.

Head of department of CCPP

Abdullov I.H.

Chief Production Engineer of CCPP

Musaev A.B.

**Individual training
PROGRAM of the GT operator**

No	Themes	Quantity of hours
1.	Basic information on the production and organization of the workplace. Duty regulations of the GT operator	8
2.	Safety, industrial hygiene and fire safety in the shop of CCGT CS. Facility regulations and safe operation of vessels, pipelines and gas facilities.	16
3.	GT flow charts and its auxiliary equipment	24
4.	Construction and principle of operation of the main and auxiliary GT equipment	32
5.	Startup, service and stop of the main and auxiliary GT. An emergency stop of the main and auxiliary equipment of GT.	32
6.	Information from the electrical engineering. Cooling service of the GT generator and seal oil system of the generator.	16
7.	ACS (automated control system) TS, technological protection and blocking of the gas turbine.	24
8.	Ways of conducting economic mode of the main and auxiliary equipment of GT.	8
9	TOTAL	160

THEME- 1. Basic information on the production and organization of the workplace.

Thermal power plant, its structure and organization. The main and auxiliary shops of the power plant, their assignment. Communication between shops. Balance of plant. Workplace, its organization and maintenance works. Internal regulations.

THEME-2. Safety, industrial hygiene and fire safety in the shop of CCGT CS.

Safety measures. Objectives of safety measures in terms of production. Legislation and supervisory authorities on work safety in the Republic of Uzbekistan.

Safety measures in the territory and in the shops of the power plant. Safety regulations for the thermal power plants within the scope of the job description. Rules of conduct in the territory and in the shops of the power plant.

Safety regulations for the operation of industrial computers.

Industrial sanitation. Objectives of industrial hygiene. Occupational diseases and their main causes. Prevention of the occupational diseases.

Basic preventive and protective measures. Personal hygiene. Self-help and first aid in case of accidents. Medical and health care of the workers in the enterprise

Fire-fighting measures. The main causes of fires in the shops and in the territory of the power plant. Inadmissibility of open fire use. Fire stations, fire protection, fire appliances, devices and alarm. Carbon dioxide fire extinguishers of the GT premises and gas-distributing center and their application rules. For safety activity indicator of the fire extinguisher.

Rules of conduct in flammable areas and during the fire. Facility regulations and safe operation of boilers, vessels, pipelines and gas facilities.

Rules of conduct in flammable places and during the fire. Facility regulations and safe operation of the vessels, boilers, pipelines and gas facilities.

THEME – 3. GT flow charts and its auxiliary equipment.

The concept of flow charts. Symbols of nodes in the diagrams. Flow (PI & D) charts of the main and auxiliary equipment of GT. Assembly drawing and its purpose. Exercises in reading charts on

studied chart. Necessary charts for the GT operator. A-21083-C, A-21082-C, A-21081-A, A-21067-A, A-21066-C, A-21065-C, A-21064-C, A-21063-C, A-21062-C, A-21061-A, A-21010, A-21084-A, A-21085-A, A-21086-A, A-21087-A, A-21088-A, A-21091-A, A-21091-A, A-21131-A, G1-79857, G1-79858, G1-99992, G1-99993, G1-99994, G1-81331, G1-99996, G1-99997, NAV-10-MB-MDL-MTG-003, NAV-10-MKB-MDD-MEL-352, NAV-10-MKB-MDD-MEL-353.

THEME – 4. Construction and principle of operation of the main and auxiliary GT equipment

Air-intake System of GT (air filters and limits of operation, media evaporator, heat exchange of air heater), GT Compressor (AGV (air guide vanes), bleed air to cool the turbine blades, compressor efficiency, pressure and temperature of the inlet and outlet air of the compressor, as well as its influence to the load of GT). Gas turbine (Degree of blades and its cooling, efficiency of the turbine, combustion chamber and its cooling, burners of GT, quantity of the GT bearings, bypass and blow off valves), the exhaust gas system. Lubrication System of GS (characteristic of lubrication pumps, oil heater of the oil tank, heat exchanger, oil separator, oil overstating of the speed). The system of regulation of gas valves (regulating oil, electrostatic oil). Fuel Gas Heater (construction and operation limits). Cooler of the cooling air of the turbine (construction and operating limits). Washing system of the blades. Evaporative cooling of the incoming air of the compressor. System versus-icing. Heater system of the inlet air. Gas distribution center of GT (control valves of gas flow and pressure, servomotor valves, gas distribution, the purge valve). The cooling system of the turbine housing. Air of CMD&A.

THEME – 5. Startup, service and stop of the main and auxiliary GT. An emergency stop of the main and auxiliary equipment of GT.

The procedure to the startup and actual start of GT (prepare permitted limits for starting, SFC preparation, lubrication system, control system, seal system of the generator, preparation of auxiliary equipment of the GT, checking the outside objects in the vicinity of the turbine and gas distribution center). Synchronization of the generator with system. Load increases up to the nominal value. The relationship between GT operators and auxiliary equipment at the load increasing. Normal Stop of GT. Saving of the fuel gas, heat and electricity. Equipment outlet into the repair. Causes and features of emergencies and measures for their elimination and prevention. Personnel's responsibility for the accident and defects. Classification of accidents and defects. Standards of technical operation of the main and auxiliary equipment, industrial and anti-damage instructions. Features of thermal mechanical equipment of the workshop in winter conditions.

THEME – 6. Information from the electrical engineering. Cooling service of the GT generator and seal oil system of the generator.

Generator characteristics of the GT (rated power, current, voltage, temperature, cooling water). Normal and emergency operation of the generator. Cooling scheme of the generator. Allowed parameters of the generator cooling and directly cooling control objects. Oil supply device for seals of the generator. Regulating of the oil supply on the seal. Limited parameters of oil supplied to the seal of the generator. Generator load depending on the type and temperature of the cooling surrounding. Scheme of the auxiliaries of the station 6 kv. and 0.4 kv. Synchronization and switching the generators to the network. Emergency discharge of the generator. The concept of electrical signaling in the unit control desk. First aid measures by electroconvulsive shock. Extinguishing a fire in electrical installations.

THEME – 7. ACS TS, technological protection and blocking of the gas turbine.

Software supply of ACS TS gas turbine. Control logic schemes. Brief description of the program "DAISYS NETMATION". Automatic level controls, combustion, power, their purpose, the principle of operation. Technological protection and blocking of the main and auxiliary equipment.

THEME – 8. *Ways of conducting economic mode of the main and auxiliary equipment of GT.*

Mode of operation of heaters and coolers. Technological protection, block and ATS, purpose and procedure of operation. Service. Influence of operational parameters works Technological parameters of main and auxiliary equipment, turbine at efficiency work.

<p>Memorandum of the Monthly Meeting</p> <p>The Project for Establishment of the Combined Cycle Gas Turbine (CCGT) Operation and Maintenance Training Center</p> <p>(The First Monthly Meeting)</p> <p>Date: 22nd December 2016 Place: Office in CCPP-1 of Navoi Thermal Power Plant (НТЭС)</p> <p>Attendees:</p> <p>1. Navoi Thermal Power Plant (NTPP) Mr. Shukhrat Dostov</p> <p>-----</p> <p>2. JICA Expert Team (JET) Mr. Hidehito Wakabayashi</p> <p>-----</p> <p>Agenda: What are discussed and agreed between NTPP and JET during the 7th Mission in December 2016.</p> <p>1. Target Values for Monitoring</p> <ul style="list-style-type: none"> (1) The number of assigned Trainers who were trained: 10 Trainers (2) The number of Trainees accredited in Uzbekenergo as CCPP O&M Staff: 150 Trainees (3) The number of accredited CCPP O&M Trainers: 10 Trainers <p>2. Trainer Candidates</p> <ul style="list-style-type: none"> (1) 13 Trainer Candidates (2) 8 Trainer Candidates will attend Training of Trainers in Japan in February 2017 (3) 8 more Trainer Candidates will attend Training of Trainers in Japan in December 2017 (4) Interview for the new three Trainer Candidates: To be discussed in January 2017 	<p>Меморандум ежемесячного собрания</p> <p>Проект технического содействия Японии «Создание Учебного Центра по Эксплуатации и Обслуживанию Парогазовых Установок Комбинированного Цикла (ПГУ) в Узбекистане»</p> <p>Дата: 22 декабря 2016 Место: ПГУ-1 Навоийской ТЭС (НТЭС)</p> <p>Присутствовали:</p> <p>1. НТЭС Г-н Шухрат Достов</p> <p>-----</p> <p>2. Группа экспертов JICA (JET) Г-н Хидехито Вакабаяши</p> <p>-----</p> <p>Повестка дня: Что было обсуждено и согласовано между НТЭС и JET во время 7-й миссии в декабре 2016г.</p> <p>1. Целевые значения для мониторинга</p> <ul style="list-style-type: none"> (1) Количество назначенных инструкторов, которые прошли обучение: 10 инструкторов (2) Число стажеров, аккредитованных в качестве Персонала по ЭиТО в Узбекэнерго: 150 стажеров (3) Число аккредитованных инструкторов по ЭиТО ПГУ: 10 инструкторов <p>2. Кандидаты в инструктора</p> <ul style="list-style-type: none"> (1) 13 Кандидатов в инструктора (2) 8 Кандидатов в инструктора будут проходить обучение инструкторов(ТОТ) в Японии в феврале 2017 года (3) Следующие 8 Кандидатов в инструктора будут проходить обучение инструкторов (ТОТ) в Японии в декабре 2017 года (4) Собеседование для новых трех кандидатов в инструктора: Будет обсуждаться в январе 2017 год
--	--

<p>3. Transfer from Tashkent to Navoi What was lectured by JET in Tashkent during May and October 2016 must be transferred by the arrangement and cooperation of Head Office of Uzbekenergo and Navoi Thermal Power Plant including travel expense and allowance and etc..</p> <p>(1) The number of textbook: No.4, 5, 7, 9 & 10</p> <p>(2) Correction and improvement of the textbooks of Russian version</p> <p>4. Schedule of Training of Trainers (TOT) As per attached</p> <p>5. Layout of Training Center As per attached</p> <p>6. Training Equipment List for Electrical Course As per attached</p> <p>Next Meeting: January 2017</p> <p>(End of Memorandum)</p>	<p>3. Передача из Ташкента в Навои Тот материал, который был обучен со стороны JET в Ташкенте в период с мая по октябрь 2016 должен быть передан с помощью Главного офиса Узбекэнерго и Навоийской ТЭС, включая расходы на поездки и пособия и т.д ..</p> <p>(1) Номера учебников: № 4, 5, 7, 9 и 10</p> <p>(2) Исправление и совершенствование учебников русской версии</p> <p>4. График обучения инструкторов (TOT) Согласно приложенным</p> <p>5. Схема учебного центра Согласно приложенным</p> <p>6. Перечень учебного оборудования для электрического курса Согласно приложенным</p> <p>Следующее собрание: январь 2017</p> <p>(Конец Меморандума)</p>
--	--

Memorandum of the Monthly Meeting
Меморандум ежемесячного собрания
The Project for Establishment of the Combined Cycle Gas Turbine
(CCGT) Operation and Maintenance Training Center

Date: 22nd December 2016 (Revised on 26th December 2016)

Дата: 22 декабря 2016 (Исправлено 26 Декабря 2016г.)

Place: Office in CCPP-1 of Navoi Thermal Power Plant (NTPP)

Место: ПГУ-1 Навоийской ТЭС (НТЭС)

Attendees: Присутствовали:

1. НТЭС

Mr. Shukhrat Dostov _____

2. JICA Expert Team (JET)

Mr. Hidehito Wakabayashi _____

~~~~~  
**Agenda:** What are discussed and agreed between NTPP and JET during the 7<sup>th</sup> Mission

**Повестка дня:** Что было обсуждено и согласовано между НТЭС и JET во время 7-й миссии

-----  
1. Target Values for Monitoring (Reference: Attachment 2-1 PDM)

The number of assigned Trainers who were trained: 10 Trainers

(1) The number of Trainees accredited in Uzbekenergo as CCPP O&M Staff: 150 Trainees

(2) The number of accredited CCPP O&M Trainers: 10 Trainers

1. Целевые значения для мониторинга (Справка: Приложение 2-1 ДПМ)

(1) Количество назначенных инструкторов, которые прошли обучение: 10 инструкторов

(2) Количество обучавшихся, которые будут аккредитованы в АО «Узбекэнерго», как персонал по эксплуатации и обслуживанию ПГУ: 150 стажеров

(3) Количество аккредитованных инструкторов по ЭиТО ПГУ: 10 инструкторов

-----  
2. Trainer Candidates (Reference: Attachment 2-3 Trainer Candidates List)

(1) 13 Trainer Candidates

(2) 8 Trainer Candidates will attend Training of Trainers in Japan in February 2017

(3) 8 more Trainer Candidates will attend Training of Trainers in Japan in December 2017

(4) Interview for the new three Trainer Candidates: To be discussed in January 2017



2. Кандидаты в инструктора (Справка: Приложение 2-3 Список кандидатов в инструктора)

(1) 13 Кандидатов в инструктора

(2) 8 Кандидатов в инструктора будут проходить обучение инструкторов(TOT) в Японии в феврале 2017 года

(3) Следующие 8 Кандидатов в инструктора будут проходить обучение инструкторов (TOT) в Японии в декабре 2017 года

(4) Собеседование для новых трех кандидатов в инструктора: Будет обсуждаться в январе 2017 года

3. Transfer from Tashkent to Navoi (Reference: Attachment 2-2 TOT Schedule)

What was lectured by JET in Tashkent during May and October 2016 must be transferred by the arrangement and cooperation of Head Office of Uzbekenergo and Navoi Thermal Power Plant including travel expense and allowance and etc..

✓ The number of textbook: No.4, 5, 7, 9 & 10

✓ Correction and improvement of the textbooks of Russian version

3. Переход из Ташкента в Навои (Справка: Приложение 2-2 График TOT)

Тот материал, который был обучен со стороны JET в Ташкенте в период с мая по октябрь 2016 должен быть передан с помощью Главного офиса Узбекэнерго и Навоийской ТЭС, включая расходы на поездки и пособия и т.д ..

✓ Номера учебников: № 4, 5, 7, 9 и 10

✓ Исправление и совершенствование учебников русской версии

4. Schedule of Training of Trainers (TOT) (Reference: Attachment 2-2 TOT Schedule)

As per attached

4. График обучения инструкторов (TOT) (Справка: Приложение 2-2 График TOT)

Согласно приложенным

5. Layout of Training Center (Reference: Attachment 2-4 Case Study on Room Arrangement)

As per attached

5. Схема учебного центра (Справка: Приложение 2-4 Пример по обустройству комнат)

Согласно приложенным

6. Training Equipment List for Electrical Course (Reference: Attachment 2-5 Equipment List)

As per attached

6. Список учебного оборудования для курсов по электрической части (Справка: Приложение 2-5 Список учебного оборудования)

Согласно приложенным

-----  
Next Meeting: January 2017

Следующее собрание: январь 2017  
-----

(End of Memorandum)

(Конец Меморандума)

## **Report of Implementation of “Handover”**

The Handover conducted by the Tashkent Trainer Candidates was reconfirmed and agreed by the management of Navoi Thermal Power Plant (NTPP) in the 7<sup>th</sup> Mission of JET in December 2016.

Implementation of “Handover” is carried out as follows;

### **1. Purpose**

Immediate start of the training for O&M of CCPP ordered by the Chairman of JSC Uzbekenergo

### **2. Handover implemented Dates**

Two days on 26<sup>th</sup> & 27<sup>th</sup> of January 2017

### **3. Venue**

Navoi Thermal Power Plant (NTPP), CCPP Unit

### **4. The persons in charge to carry out “Handover”**

Three Trainer Candidates from Tashkent:

Mr.Sobirov Bakhrom -UZE head office

Mr.Khudoyberganov Askar -Tashkent TPP

Mr.Shamsiev Rasul- TashTETS

### **5. The persons in charge to accept “Handover”**

The Trainer Candidates selected from Navoi Thermal Power Plant

### **6. Handover is held on following textbooks**

Handover on Textbooks of No.4, No.5, No.7 was held to the time constraints of “Handover”

### **7. The contents of “Handover”**

7-1. Comprehensive Review of No.4, No.5, No.7

7-2. Discussion including Question & Answer and the scheduling of the remaining subjects

7-3. Tashkent trainer candidates have visited the site of CCPP together with Navoi candidates in order to understand better by themselves. Navoi candidates have explained the all facilities of main and auxiliary equipment of CCPP to Tashkent candidates. To be honest, Handover was

26&27 January 2017

more useful for Tashkent candidates rather than to Navoi candidates. Shamsiev, who works in TashTETS, basically answered the questions of Navoi candidates, because of his operation experience of Gas turbine. But the questions were about the details of Gas turbine, which is installed in TashTETS.

The handover was held at the same dates with Monthly Meeting of January 2017.

( end of “Handover Report ”)

## **Agendas of the Monthly Meeting in January 2017**

The Monthly Meeting in January 2017 carried out to follow up “Handover” conducted in January 2017 and to identify the best solution for the current problems and matters related to “Handover”.

### **1. Agendas**

- (1) The financial arrangement for travel expense, allowance and etc. implemented by Uzbekenergo and Navoi Thermal Power Plant (NTPP)
  - a. To have comprehensive discussion to carry out the confirmed and agreed action plan of “Handover“ at the 6<sup>th</sup> Mission in October 2016
- (1)-2 The first Handover was held on 26 & 27th January 2017 by three Tashkent trainer candidates to new Navoi trainer candidates at NAVOI TPP, CCPP Unit. Handover was made for Textbooks No4, No5 and No7. Textbook No9 and No10 was not finished yet.
- (2) The schedule for the further “Handover” before the 8<sup>th</sup> Mission, i.e. the next Handover will be held on 03.04.2017, if necessary.
- (3) The plan and schedule of training implemented by NTPP  
In January training of trainees has not started. Actual training of 150 trainees will be started from April 2017.
- (4) The construction of the building of the new Training center is not started yet. But the conclusion of architectural authority of Navoi for construction of New training center in that planned building is received. The building design documentation is being developed now. After that construction will start.

### **2. Date**

AM of 27<sup>th</sup> of January 2017

### **3. Venue**

Navoi Thermal Power Plant (NTPP), CCPP Unit

### **4. The persons in charge to attend the Monthly Meeting**

Training Center Director: Mr. Shukhrat Dostov

27th January 2017

Mr.Abdullaev Ikhtiyar

JET: Mr. Umid Usmanov / Mr. Hidehito Wakabayashi (telephoning from Tokyo)

The Trainer Candidates from NTPP

( end of “Agenda of the Monthly Meeting”)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Memorandum of the Monthly Meeting</b></p> <p><b>The Project for Establishment of the Combined Cycle Gas Turbine (CCGT) Operation and Maintenance Training Center</b></p> <p><b>(The Second Monthly Meeting)</b></p> <p><b>Date:</b> 13<sup>th</sup> February 2017<br/> <b>Time:</b> 12:30~13:30<br/> <b>Place:</b> Office in Chugoku EPCO Head Office</p> <p><b>Attendees:</b></p> <ol style="list-style-type: none"> <li>1. Navoi Thermal Power Plant (NTPP)<br/> Mr. Kahramon GANIEV<br/> Mr. Alisher MUSAEV<br/> Mr. Bakhodir DJAMALOV</li> <li>2. JICA<br/> Ms. Masuya, Ms. Tanaka</li> <li>3. JET<br/> Mr. Murata, Mr. Saito, Mr. Nishio, Mr. Miyamoto, Mr. Hasebe, Mr. Umid<br/> Chairperson: Mr. Wakabayashi</li> <li>4. Observer<br/> Mr. Harada (Chugoku EPCO)</li> </ol> <p>-----</p> <p><b>Agenda:</b> What are discussed and agreed between NTPP and JET during the TOT in Japan in February 2017.</p> <ol style="list-style-type: none"> <li>1. Training Plan <ol style="list-style-type: none"> <li>(1) Answer and Comments to the questionnaires and requests of Head of Navoi Training Center</li> <li>(2) Question &amp; Answer</li> </ol> </li> <li>2. Overview of Joint Coordination Committee (JCC) <ol style="list-style-type: none"> <li>(1) Orientation &amp; Guideline</li> <li>(2) Date / Venue: May 9~12, 2017 @ Tashkent or Navoi</li> <li>(3) Agendas: a New Project Structure<br/> b Achievement of Project (Each Development, Monitoring Sheet 3)<br/> c Proposal of Roadmaps (Humanresource Development, Plan, Training Plan, Accreditation System)<br/> d Support Measures &amp; Advice to Training 150 staffs (including handover to Navoi from Tashkent)</li> </ol> </li> </ol> | <p><b>Меморандум ежемесячного собрания</b></p> <p><b>Проект технического содействия Японии «Создание Учебного Центра по Эксплуатации и Обслуживанию Парогазовых Установок Комбинированного Цикла (ПГУ) в Узбекистане»</b></p> <p><b>Дата:</b> 13 февраля 2017<br/> <b>Время:</b> 12:30-13:30<br/> <b>Место:</b> Головной офис Тюгоку Электрик(СЕРСО)</p> <p><b>Присутствовали:</b></p> <ol style="list-style-type: none"> <li>1. НТЭС<br/> Г-н Кахрамон ГАНИЕВ<br/> Г-н Алишер МУСАЕВ<br/> Г-н Баходир ДЖАМАЛОВ</li> <li>2. ДЖАЙКА<br/> Г-жа Масуя, Г-жа Танака</li> <li>3. Группа экспертов ДЖАЙКА<br/> Г-н Мурата, Г-н Сайто, Г-н Нишио, Г-н Миямото, Г-н Хасебэ, Г-н Усманов<br/> Ведущий Г-н Вакабаяши</li> <li>4. Наблюдатель<br/> Г-н Харада (СЕРСО)</li> </ol> <p>-----</p> <p><b>Повестка дня:</b> Что было обсуждено и согласовано между НТЭС и ЖЕТ во время обучения в Японии в феврале 2017г.</p> <ol style="list-style-type: none"> <li>1. Учебный план <ol style="list-style-type: none"> <li>(1) Ответы и комментарии на вопросы и требования главы учебного центра в Навои</li> <li>(2) Вопросы и ответы</li> </ol> </li> <li>2. Обзор совместного координационного комитета (СКК) <ol style="list-style-type: none"> <li>(1) Ориентация и руководство</li> <li>(2) Дата/ место: май 9-12 2017г. В Ташкенте или Навои</li> <li>(3) Повестка: А Новая структура проекта<br/> Б Достижения проекта (каждое достижение, Мониторинг лист 3)<br/> В Предложение Дорожных карт (План подготовки кадров, Учебный план, Системы аккредитации)<br/> Г Меры по поддержке и советы по обучению 150 сотрудников (включая передачи в Навои из Ташкента)</li> </ol> </li> </ol> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                  |                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>3. Other Issues</p> <p>(1) Support Measures for Handover to Navoi from Tashkent</p> <p>(2) New Allowance and Salary Systems to secure Trainers</p> <p>Next Meeting: March 2017</p> <p>(End of Memorandum)</p> | <p>3. Другие вопросы</p> <p>(1) Меры по поддержке для передаче в Навои из Ташкента</p> <p>(2) Новые системы пособий и окладов для закрепления тренеров</p> <p>Следующее собрание: март 2017</p> <p>(Конец Меморандума)</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>Memorandum of the Monthly Meeting</b><br/><b>the Project for Establishment of the Combined</b><br/><b>Cycle Gas Turbine (CCGT) Operation and</b><br/><b>Maintenance Training Center</b><br/><br/><b>(The Third Monthly Meeting)</b></p> <p>Date: March 24<sup>th</sup>, 2017<br/>Venue: Office of CCPP-1 Navoi Thermal Power Plant</p> <p>Attendees:</p> <ol style="list-style-type: none"> <li>1. Navoi Thermal Power Plant (NTPP)<br/>Mr. Shukhrat Dostov</li> <li>2. JICA Expert Team (JET)<br/>Mr. Yukihiro Murata<br/>Mr. Hidehito Wakabayashi<br/>Mr. Hideaki Iwashita</li> </ol> <p>~~~~~</p> <p>Navoi, March 24<sup>th</sup>, 2017</p> <ol style="list-style-type: none"> <li>1. Navoi Thermal Power Plant(NTPP)<br/>Mr. Shukhrat Dostov</li> </ol> <p>-----</p> <ol style="list-style-type: none"> <li>2. JICA Expert Team (JET)<br/>Mr. Hidehito Wakabayashi</li> </ol> <p>-----</p> | <p style="text-align: center;"><b>Меморандум по ежемесячному</b><br/><b>совещанию по проекту создания</b><br/><b>Учебного центра по эксплуатации и</b><br/><b>техническому обслуживанию</b><br/><b>парогазовой турбины</b><br/><b>комбинированного цикла (ПГТ)</b><br/><b>(Третье ежемесячное совещание)</b></p> <p>Дата: 24 марта 2017 г.<br/>Место проведение: Офис ПГУ-1<br/>Навоийской тепловой электростанции</p> <p>Участники:</p> <ol style="list-style-type: none"> <li>1. Навоийская тепловая электростанция (НТЭС) – г-н Достов Шухрат</li> <li>2. Группа экспертов JICA (JET)<br/>Г-н Юкиhiro Мурата<br/>Г-н Хидехито Вакабаяши<br/>Г-н Хидеаки Ивашита</li> </ol> <p>_____</p> <p>Навои, 24 марта 2017 г.</p> <ol style="list-style-type: none"> <li>1. Навоийская тепловая электростанция (НТЭС) – г-н Достов Шухрат</li> </ol> <p>_____</p> <ol style="list-style-type: none"> <li>2. Группа экспертов JICA (JET)<br/>Г-н Хидехито Вакабаяши</li> </ol> <p>_____</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Agenda:<br/>What are discussed and agreed between NTPP and JET during the March 9<sup>th</sup> and 31<sup>st</sup>, 2017 as below;</p> <p>(1) <u>Management Structure of The New Training Center</u><br/>(1)-1 Mr. Kahramon GANIEV, General Director of JSC «Navoi Thermal Power Plant» was appointed as Project Director of “the Project”.<br/>(1)-2 Mr. Shukhrat SHERALIEV, Deputy Chairman of the Board of JSC «Uzbekenergo» was appointed as Project Manager of “the Project”.<br/>(1)-3 Mr. Shukhrat DOSTOV of JSC «NTPP» was appointed as Training Center Director of “the Project”.<br/><br/>Regarding “Management Structure of The New Training Center” as agreed above will be officially approved by Joint Coordination Committee (hereinafter referred to as “JCC”) reviewed and discussed as below;</p> <p>(2) <u>Joint Coordination Committee (hereinafter referred to as “JCC”)</u><br/>Considering the fundamental change of “the Project”, i.e. the top management of Uzbekenergo, the location site of the new CCPP training center, trainers’ candidates and etc., the following are proposed as the overview of the 2<sup>nd</sup>JCC.</p> <p><u>Orientation &amp; Guideline</u><br/>(2)-1 Date/Venue:<br/>One day during May 15~19, 2017 at Navoi<br/>(2)-2 Agendas<br/>(a) New Project Organization<br/>(b) Achievement of Project (Each Development: Monitoring Sheet 3)<br/>(c) Proposal of Roadmaps (Human Resource Development Plan, Training Plan, Accreditation System)<br/>(d) Support Measures &amp; Advice to Training 150 staffs of Uzbekenergo CCPP</p> <p style="text-align: right;"><i>End of the Attachment</i></p> | <p>Повестка дня:<br/>Какие вопросы обсуждались и были согласованы между НТЭС и JET в период с 9 по 31 марта 2017 г., как указано ниже;</p> <p>(1) <u>Структура управления новым Учебным центром</u><br/>(1)-1 г-н ГАНИЕВ Кахрамон, Генеральный директор АО «Навоийская тепловая электростанция» был назначен Директором Проекта.<br/>(1)-2 Г-н ШЕРАЛИЕВ Шухрат, Заместитель Председателя правления АО «Узбекэнерго» был назначен Менеджером Проекта.<br/>(1)-3 Г-н ДОСТОВ Шухрат от АО «НТЭС» был назначен Директором Учебного центра Проекта.<br/><br/>«Структура управления новым Учебным центром», как было договорено выше, будет официально утверждена Совместным координационным комитетом (далее именуемым «СКК»), согласно нижеприведенному обзору и обсуждению;</p> <p>(2) <u>Совместный координационный комитет (далее именуемый «СКК»)</u><br/>Учитывая кардинальное изменение «Проекта», т.е., высшего руководства Узбекэнерго, места размещения нового Учебного центра ПГУ, кандидатов в инструкторы и т.д., в качестве обзора 2-го заседания СКК предлагаем следующее.</p> <p><u>Ориентация и руководство</u><br/>(2)-1 Дата/место проведения<br/>Один день между 15 и 19 мая 2017г. в Навои<br/>(2)-2 Повестки дня<br/>(а) Новая организация Проекта<br/>(б) Достижения Проекта (каждое достижение: Мониторинг Лист 3)<br/>(в) Предложение сценариев развития (План подготовки кадров, Учебный план, Система аккредитации)<br/>(г) Меры поддержки и консультирование в обучении 150 человек персонала ПГУ при Узбекэнерго.</p> <p style="text-align: right;"><i>Конец Приложения</i></p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Memorandum of the Monthly Meeting</b></p> <p><b>The Project for Establishment of the Combined Cycle Gas Turbine (CCGT) Operation and Maintenance Training Center</b></p> <p><b>(Monthly Meeting in July/August 2017)</b></p> <p><b>Date:</b> August 1<sup>st</sup>, 2017<br/> <b>Venue:</b> Office in CCPP-1 of Navoi Thermal Power Plant</p> <p><b>Attendees:</b></p> <p>1. Navoi Thermal Power Plant (NTPP)</p> <p>① Mr. Kakhramon GANIEV<br/>Project Director / General Director (as a witness)</p> <p>2. Navoi Training Center (NTC)</p> <p>① Mr. Shukhrat DOSTOV<br/>Director of NTC</p> <p>② Mr. Alisher MUSAEV<br/>CCPP Operational &amp; Principal Engineer</p> <p>3. JICA Expert Team (JET)</p> <p>① Mr. Hidehito WAKABAYASHI</p> <p>② Mr. Takashi SAITO</p> <p>③ Mr. Kazuaki NEMOTO</p> <p>④ Ms. Akiko SAKUMA</p> <p>⑤ Ms. Indira ISKANDOROVA</p> <p>1. Navoi Thermal Power Plant (NTPP)<br/>Mr. Kahramon GANIEV<br/>Project Director / General Director (As a witness)</p> <p>-----</p> <p>2. Navoi Training Center (NTC)<br/>Mr. Shukhrat DOSTOV<br/>Director of NTC</p> <p>-----</p> <p>3. JICA Expert Team (JET)<br/>Mr. Hidehito Wakabayashi</p> <p>-----</p> | <p><b>Меморандум ежемесячного совещания</b></p> <p><b>по Проекту «Создания Учебного Центра по Эксплуатации и Обслуживанию Парогазовых Установок Комбинированного Цикла (ПГУ) в Узбекистане»</b></p> <p><b>(Ежемесячное совещание Июль/Август 2017 года)</b></p> <p><b>Дата:</b> 1 августа 2017 года<br/> <b>Место:</b> ПГУ-1 Навоийской ТЭС (НТЭС)</p> <p><b>Присутствовали:</b></p> <p>1. НТЭС</p> <p>○ Г-н Ганиев Кахрамон<br/>Директор Проекта, Генеральный Директор (в качестве свидетеля)</p> <p>2. Навоийский Учебный Центр (НУЦ)</p> <p>○ Г-н Достов Шухрат<br/>Директор Навоийского Учебного Центра</p> <p>○ Г-н Мусаев Алишер<br/>Ведущий инженер ТМО Навоийской ПГУ.</p> <p>3. Группа экспертов JICA (JET)</p> <p>○ Г-н Вакабаяши Хидехито</p> <p>○ Г-н Сайто Такаши</p> <p>○ Г-н Немото Казуаки</p> <p>○ Г-жа Сакума Акико</p> <p>○ Г-жа Искандарова Индира</p> <p>1. Навоийская ТЭС (НТЭС)<br/>Г-н Ганиев Кахрамон<br/>Директор Проекта / Генеральный Директор (в качестве свидетеля)</p> <p>-----</p> <p>2. Навоийский Учебный Центр<br/>Г-н Достов Шухрат<br/>Директор Навоийского Учебного Центра</p> <p>-----</p> <p>3. Группа экспертов JICA<br/>Г-н Вакабаяши Хидехито</p> <p>-----</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Agenda:** What are discussed and agreed between NTPP, NTC and JET during the July August Monthly Meeting;

### 1. Official letter from JSC «Uzbekenergo» to NTPP for the document submission

JET reminded JSC «Uzbekenergo» to submit the official letter to provide JET with the following documents;

- ① Policy of CCPP O&M
- ② Company Standard
- ③ Job description

### 2. The results of TOT attendees in July (as of July 31<sup>st</sup>, 2017)

As shown in the table, the first session of “Mechanics” is terribly bad. The both average of Trained and non-Trained in Japan are 3.3 persons per day. The first day of the “Mechanics” was not conducted because of the number is only one from the trained trainers in Japan.

**Attendees of TOT During the 9th Mission**

| Month & Date | Field   | Trainers                            | Textbooks  | Category of TOT |         | Numbers of Attendees |                      |
|--------------|---------|-------------------------------------|------------|-----------------|---------|----------------------|----------------------|
|              |         |                                     |            | TOT             | Mock-up | Trained in Japan     | Not Trained in Japan |
| July         | 19 Wed  | M. Hasebe                           | No.3       | N/A             |         | 1                    | 0                    |
|              | 20 Thur | M. Hasebe                           | No.3       | ◎               |         | 3                    | 1                    |
|              | 21 Fri  | M. Hasebe                           | No.3       | ◎               |         | 1                    | 2                    |
|              | 22 Sat  |                                     |            |                 |         |                      |                      |
|              | 23 Sun  |                                     |            |                 |         |                      |                      |
|              | 24 Mon  | Mr. Hasebe (Mr. Miyamoto)           | No.3       | ◎               |         | 1                    | 2                    |
|              | 25 Tues |                                     |            |                 |         |                      |                      |
|              | 26 Wed  | Equip. Watanabe                     | No.9       | ◎               |         | 2                    | 3                    |
|              | 27 Thur | Equip. Watanabe                     | No.10      | ◎               |         | 6                    | 3                    |
|              | 28 Fri  | Electric Mr. Kobayashi / Mr. Suzuki | No.6, No.7 | ◎               |         | 2                    | 3                    |
| Aug          | 29 Sat  |                                     |            |                 |         |                      |                      |
|              | 30 Sun  |                                     |            |                 |         |                      |                      |
|              | 31 Mon  | Electric Mr. Kobayashi / Mr. Suzuki | No.6       | ◎               |         | 6                    | 2                    |
|              | 1 Tues  | Electric Mr. Kobayashi / Mr. Suzuki | No.6       | ◎               |         |                      |                      |
|              | 2 Wed   | Electric Mr. Kobayashi / Mr. Suzuki | No.7       | ◎               |         |                      |                      |
|              | 3 Thur  | Electric Mr. Kobayashi / Mr. Suzuki | No.7       | ◎               |         |                      |                      |

As of July 31<sup>st</sup>, 2017

On Friday, July 28, 2017, JET complained Mr. GANIEV of NTPP of the less attendees especially on “Mechanics” course during 19 and 24 of July as shown in the table. Mr. GANIEV made clear statement to the Director, Mr. DOSTOV and CCPP Operational & Principal Engineer, Mr. MUSAEV to improve the TOT attendees results by work shift and or work scheduling according to the TOT schedule informed from Japan in advance.

### 3. Structure to have sustainable TOT in

**Повестка дня:** Следующее было обсуждено и согласовано между НТЭС, НУЦ и Группой экспертов ЛСА во время ежемесячного совещания Июля-Августа 2017 года:

### 1. Официальное письмо от АО «Узбекэнерго» в НТЭС для представления документов

Группа экспертов ЛСА напомнила АО «Узбекэнерго» о предоставлении официального письма для получения Группой экспертов ЛСА следующих документов:

1. Политика ПГУ КЦ;
2. Стандарт Предприятия;
3. Должностные Инструкции.

### 2. Результаты посещаемости TOT (Тренинга для Инструкторов) в июле (по состоянию на 31 июля 2017 года)

Как указано в таблице, первая сессия по «Механической части» была крайне неудовлетворительна. Средний показатель обеих групп (тех, кто, прошел обучение в Японии и тех, кто не прошёл) составил 3,3 человека в день. Первый день обучения по «Механической части» не состоялся из-за того, что количество инструкторов было всего 1 человек из обученных в Японии,.

**Участники TOT во время 9-й миссии**

| Месяц, день | Область | Эксперты            | № учебника                | Категория TOT |                   | Количество участников |                       |
|-------------|---------|---------------------|---------------------------|---------------|-------------------|-----------------------|-----------------------|
|             |         |                     |                           | TOT           | Практика обучения | Обученные в Японии    | Не обученные в Японии |
| Июль        | 19 Ср   | Механическая часть  | Г-н Хасебе                | No.3          | Не было           |                       | 0                     |
|             | 20 Чт   | Механическая часть  | Г-н Хасебе                | No.3          | ◎                 | 3                     | 1                     |
|             | 21 Пт   | Механическая часть  | Г-н Хасебе                | No.3          | ◎                 | 1                     | 2                     |
|             | 22 Суб  |                     |                           |               |                   |                       |                       |
|             | 23 Вс   |                     |                           |               |                   |                       |                       |
|             | 24 Пн   | Механическая часть  | Г-н Хасебе (Г-н Миямото)  | No.3          | ◎                 | 1                     | 2                     |
|             | 25 Вт   |                     |                           |               |                   |                       |                       |
|             | 26 Ср   | Оборудование        | Ватанабе                  | No.9          | ◎                 | 2                     | 3                     |
|             | 27 Чт   | Оборудование        | Ватанабе                  | No.10         | ◎                 | 6                     | 3                     |
|             | 28 Пт   | Оборудование        | Г-н Кобаяши               | No.6, No.7    | ◎                 | 2                     | 3                     |
| Август      | 29 Суб  |                     |                           |               |                   |                       |                       |
|             | 30 Вс   | Электрическая часть | Г-н Кобаяши / Г-н Судзуки |               |                   |                       |                       |
|             | 31 Пн   | Электрическая часть | Г-н Кобаяши / Г-н Судзуки | No.6          | ◎                 | 6                     | 2                     |
|             | 1 Вт    | Электрическая часть | Г-н Кобаяши / Г-н Судзуки | No.6          | ◎                 |                       |                       |
|             | 2 Ср    | Электрическая часть | Г-н Кобаяши / Г-н Судзуки | No.7          | ◎                 |                       |                       |
|             | 3 Чт    | Электрическая часть | Г-н Кобаяши / Г-н Судзуки | No.7          | ◎                 |                       |                       |

На 31 июля 2017 г.

В пятницу, 28 июля 2017 года, Группа экспертов ЛСА пожаловалась г-ну Ганиеву о малом количестве слушателей, особенно на курсах по «Механической части» в период с 19го по 24го июля, как показано в таблице. Г-н Ганиев дал четкое задание директору г-ну Достову и ведущему инженеру ТМО ПГУ г-ну Мусеву об улучшении результатов участия в Тренинге для Инструкторов путем переброски смены работы и / или планирования работы в соответствии с графиком TOT тренингов,

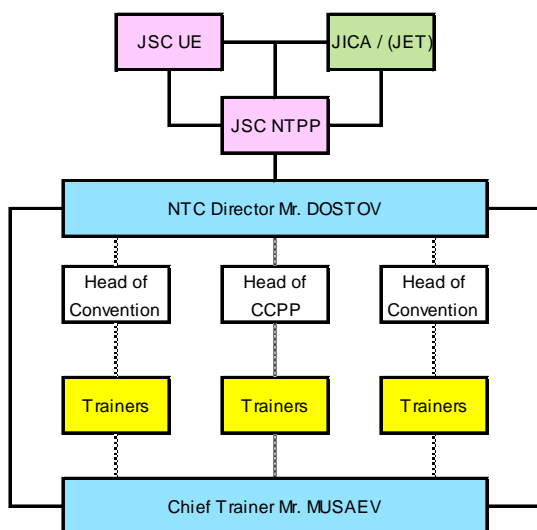
## Uzbekistan

After the discussion on the day of July 28<sup>th</sup>, 2017, between Mr. GANIEV and JET, JET considered and proposed the following solutions to improve the numbers of attendees of TOT.

JET usually informs of TOT schedule to JICA HQ and JICA Uzbekistan Office will submit the official letter to JSC «Uzbekenergo» in advance. In the 9<sup>th</sup> Mission, JET wondered if the official letter from JSC «Uzbekenergo» was delivered to NTPP for the TOT schedule or not.

Therefore, JET planed the following structure of the TOT schedule and information submission correctly.

The blue colored are the key stakeholders, i.e. NTC Director Mr. DOSTOV and Chief Trainer Mr. MUSAEV. After the TOT schedule was informed to NTPP and NTC, Mr. DOSTOV and Mr. MUSAEV will have to coordinate with the head of each group both of CCPP-1 and Conventional plants, according to the instruction by Mr. GANIEV.



The Project Director of NTPP and the Director of NTC agreed with the structure.

(End of Memorandum)

заранее сообщаемым из Японии.

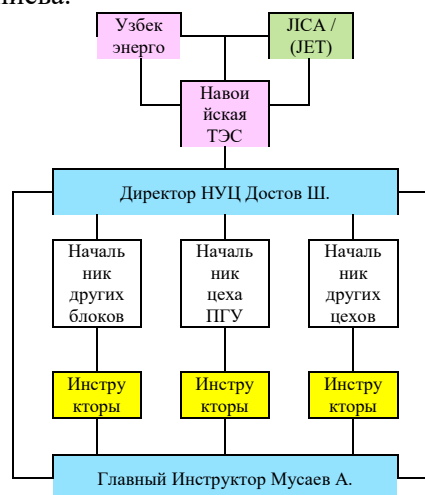
## 3. Структура для устойчивого проведения TOT Тренингов для Инструкторов в Узбекистане

28 июля 2017 года после обсуждений между г-ном Ганиевым и Группой экспертов JICA, эксперты JICA рассмотрели и предложили следующие решения для улучшения числа участников Тренингов для Инструкторов. Группа экспертов JICA обычно информирует о расписании TOT Тренингов для Инструкторов Штаб-квартиру JICA и Представительство JICA в Ташкенте, в свою очередь, представляет официальное письмо в АО «Узбекэнерго» заранее. В 9-й миссии Группа экспертов JICA задалась вопросом, было ли официальное письмо с расписанием Тренингов для Инструкторов от АО «Узбекэнерго» передано в НТЭС или нет.

В связи с этим, Группа экспертов JICA спланировала следующую структуру расписания тренингов для инструкторов и представления информации.

Синим цветом выделены ключевые заинтересованные стороны, т.е. Директор НУЦ г-н Достов и главный инструктор г-н Мусаев.

После того, как график Тренинга для Инструкторов будет выслан в НТЭС и НУЦ, г-н Достов и г-н Мусаев должны будут скоординировать свои действия с руководителями каждого цеха как ПГУ-1, так и остальных блоков ТЭС, согласно поручению г-на Ганиева.



Директор проекта НТЭС и директор НУЦ согласились со структурой.

(Конец Меморандума)



31.10.2017

**Меморандум ежемесячного совещания по Проекту «Создания Учебного Центра по  
Эксплуатации и Обслуживанию Парогазовых Установок Комбинированного Цикла  
(ПГУ) в Узбекистане»  
(Ежемесячное совещание Октябрь 2017года)**

**Дата:** 31 октября 2017 года

**Присутствовали:**

1. Г-н Шухрат ДОСТОВ (Навоийский Учебный Центр: НУЦ)
2. Г-н Хидехито ВАКАБАЯШИ (JET) / Г-н Кадзуаки НЕМОТО (JET)
3. Г-н Умид УСМАНОВ (JET)

1. Навоийский Учебный Центр  
Г-н Достов Шухрат  
Директор Навоийского Учебного Центра

-----

2. Группа экспертов ЛСА  
Г-н Вакабаяши Хидехито

-----

## Повестка дня и протоколы

### 1. Статус обучения для подготовки персонала НУЦ

JET проанализировала ситуацию с пробным обучением (начиная с апреля 2017 года) на семинаре (проведенном 25 июля 2017 года), проведенном на девятой миссии следующим образом.

(1) Для пробного обучения, выбрали целевую аудиторию, для которой можно сделать это наиболее легко (не требует командировочных и др. расходов, имея в виду, что людей можно было легко выбирать). Целевой аудиторией тренинга были 35 человек, отобранных из персонала Навоийской ТЭС.

(2) Обученные предметы № 4, 5, 9, 10. Преподавателями были г-н Алишер Мусаев и другие кандидаты-инструкторы.

(3) Что касается полноценного обучения персонала, последующая за пробным обучением, мы думаем, что должны пройти обучение сотрудники, необходимые для вновь строящихся в ближайшем будущем Навоийской ПГУ-2 и Туракурганской ПГУ.

Однако было установлено, что имена и принадлежность этих сотрудников могут подтвердиться только за шесть месяцев до завершения строительства ПГУ. Поэтому при осуществлении полномасштабного обучения мы указали только численность персонала для обучения персонала в штаб-квартиру УЭ.

Исходя из вышеприведенного предположения, JET, Навоийская тепловая электростанция (НТЭС) и НУЦ получили заключения о желаемой подготовке персонала путем обмена мнениями.

| Задача                                                                                                   | Запрос / вопрос от JET                                                                                                                         | Реакция НТЭС • НУЦ                                                                                                                         | Заключение                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Цель обучения персонала в течение проектного периода: 150 человек (Крайний срок конец декабря 2018 года) | Полномасштабное обучение после пробного обучения будет проводиться не только для Навои, но и для персонала на тепловых электростанциях под УЭ. | Для этой цели требуются транспортные и командировочные расходы до Навои. Кроме того, лекторам также потребуется пособие для преподавателей | НТЭС / НУЦ предложит следующее предложение в штаб-квартире УЭ и получит одобрение (до конца ноября 2017 года)<br>· Выплата командировочных расходов и пособий персонала до Навои<br>· Институционализация пособия преподавателям |
|                                                                                                          | • Определить 150 человек.<br>· Установить график обучения                                                                                      | • Обсудить с управлением по работе с персоналом и                                                                                          | Подтвердить следующее (до конца ноября 2017 года)                                                                                                                                                                                |



|  |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>для 150 человек</p> <ul style="list-style-type: none"> <li>· Если 150 человек не могут быть обеспечены под УЭ, НТЭС / НУЦ будет вести переговоры для охвата предполагаемых выпускников, университетов и т.д.</li> </ul> | <p>управлением эксплуатации электростанций головного офиса УЭ для определения 150 человек.</p> <ul style="list-style-type: none"> <li>· Если не сможем обеспечить 150 человек под УЭ, то необходимо обсудить с штаб-квартирой УЭ для охвата предполагаемых выпускников, университетов и т.д.</li> </ul> | <ul style="list-style-type: none"> <li>· Определить 150 человек на основе консультаций с головным офисом УЭ.</li> <li>· Если в рамках УЭ насчитывается менее 150 сотрудников, в качестве головного офиса УЭ решить охватить будущих выпускников университетов.</li> <li>· График обучения 150 человек должен выполняться с ответственностью в качестве предметов исключительного решения НУЦ.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2. Статус учебного оборудования

| Задача                                           | Запрос / вопрос от ЖЕТ                                                                                                                                                                                                                                                                                              | Реакция НТЭС • НУЦ | Заключение |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------|
| Текущее положение проектирования учебного центра | <ul style="list-style-type: none"> <li>· Продолжают ли выполняться проектные работы учебного центра?</li> <li>· Или уже завершены проектные работы учебного центра?</li> <li>· Учитываются ли советы, предоставленные ЖЕТ в ходе 9-й миссии?</li> </ul>                                                             |                    |            |
| Тендер, график строительства                     | <ul style="list-style-type: none"> <li>· В 9-й миссии мы слышали, что публичное уведомление о торгах было опубликовано, но был ли проведен тендер?</li> <li>· Был ли выбран победитель торгов?</li> <li>· Как мы слышали в 9-й миссии, правильно ли понимать, что процесс строительства будет завершен к</li> </ul> |                    |            |

|                                                                   |                                                                                                                                                                                                                                                                                              |  |  |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                                                                   | концу марта 2018 года?                                                                                                                                                                                                                                                                       |  |  |
| Вопросы, касающиеся поставляемого оборудования Узбекской стороной | <ul style="list-style-type: none"> <li>Хотелось бы услышать о текущем состоянии поставляемого оборудования Узбекской стороной.</li> <li>В частности, просим подготовить и отправить г-ну Немото список для каждого элемента, в котором четко указаны дата поставки / спецификация</li> </ul> |  |  |

10/31/2017

**Memorandum of the monthly meeting of the Project for**  
**"Establishment of the Training Center for Operation and Maintenance**  
**of Combined Cycle Power Plant (CCPP) in Uzbekistan"**  
**(Monthly meeting October 2017)**

**Date:** October 31, 2017

**Attendees:**

1. Mr. Shukhrat DOSTOV (Navoi Training Center: NTC)
2. Mr. Hidehito WAKABAYASHI (JET) / Mr. Kazuaki NEMOTO (JET)
3. Mr. Umid Usmanov (JET)

1. Navoi Training Center  
Mr. Dostov Shukhrat  
Director of the Navoi Training Center

-----

2. The JICA Experts Team  
Mr. Wakabayashi Hidehito

-----

## **Agenda and minutes**

### **1. The status of the training of personnel by NTC**

JET analyzed the situation with trial training (beginning in April 2017) at the workshop (held on July 25, 2017), conducted at the ninth mission as follows.

(1) For trial training, they have chosen the target audience for which it can be done most easily (does not require travel and other expenses, meaning that people could be easily chosen). The target audience of the training was 35 people, selected from the staff of Navoi TPP.

(2) Trained subjects No. 4, 5, 9, 10. The instructors were Mr. Alisher Musaev and other trainer candidates.

(3) As regards the full-fledged training of personnel, following the trial training, we think that the staff necessary for the Navoi CCPP-2 and Turakurgan CCPP to be built in the near future must be trained.

However, it was found that the names and affiliation of these employees can be confirmed only six months before the completion of the CCGT construction. Therefore, in the implementation of full-scale training, we indicated only the number of staff to train at the UE headquarters.

-----

Based on the above assumption, JET, Navoi Thermal Power Plant (NTPP) and NTC received conclusions on the desired training of personnel through the exchange of opinions.

| Task                                                                                        | Request / question from JET                                                                                            | Reaction of NTPP • NTC                                                                                                               | Conclusion                                                                                                  |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| The goal of training staff during the project period: 150 people (Deadline end of December) | Full-scale training after trial training will be conducted not only for Navoi, but also for personnel in thermal power | For this purpose, transportation and travel expenses are required till Navoi. In addition, the lecturers will also need an allowance | NTPP / NTC to propose the following proposal at the UE headquarters and receive approval (before the end of |

|       |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2018) | plants under the UE.'                                                                                                                                                                                                                                                          | for teachers                                                                                                                                                                                                                                                                                                                           | November 2017)<br><ul style="list-style-type: none"> <li>• Payment of travel expenses and staff allowance to Navoi</li> <li>• Institutionalization of payments for teachers</li> </ul>                                                                                                                                                                                                                                                                                         |
|       | <ul style="list-style-type: none"> <li>• To identify 150 people.</li> <li>• To set a training schedule for 150 people</li> <li>• If 150 people can not be provided under the UE, the NTPP / NTC will negotiate to reach prospective graduates of universities, etc.</li> </ul> | <p>Discuss with the HR department and operation of power plants department of the UE head office to identify 150 people.</p> <ul style="list-style-type: none"> <li>• If UE can not provide 150 people under the UE, it is necessary to discuss with the UE headquarter to reach prospective graduate of universities, etc.</li> </ul> | <p>To confirm the following (until the end of November 2017)</p> <ul style="list-style-type: none"> <li>• To identify 150 people on the basis of consultations with the UE head office.</li> <li>• If the UE has fewer than 150 employees, it is up to the UE's head office to reach out to future university graduates.</li> <li>• The training schedule of 150 people should be carried out with responsibility as subjects of the exclusive decision of the NTC.</li> </ul> |

## **2. The status of training equipment**

| Task                                                   | Request / question from JET                                                                                                                                                                                                                                                                                                               | Reaction of NTPP • NTC                                                                                                                                                                                                    | Conclusion |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Current situation of the design of the training center | <p>Are the design works of the training center being continued?</p> <ul style="list-style-type: none"> <li>· Have the design works of the training center been completed already?</li> <li>· Are the advices provided by JET during the 9th mission taken into account?</li> </ul>                                                        | <p>The design work of the training center has been completed.</p> <p>All JET advises are taken into account</p>                                                                                                           |            |
| Tender, construction schedule                          | <p>In the 9th mission, we heard that a public notice of the bidding was published, but was a tender held?</p> <ul style="list-style-type: none"> <li>• Was the winner selected?</li> <li>• As we heard in the 9th mission, is it right to understand that the construction process will be completed by the end of March 2018?</li> </ul> | <p>The announcements are published in the newspapers “Dustlik Bayrogi” and “Banner of friendship”. Documentation for the tender is being accepted.</p> <p>The construction will be completed by the end of March 2018</p> |            |

|                                                             |                                                                                                                                                                                                                                                                                                  |                                                                                                                          |  |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--|
| Issues relating to the supplied equipment by the Uzbek side | <ul style="list-style-type: none"> <li>• We would like to hear about the current state of the supplied equipment by the Uzbek side.</li> <li>• In particular, please prepare and send to Mr. Nemotot a list for each item that clearly indicates the date of delivery / specification</li> </ul> | <p>Order is accepted by the OMTC(Perhaps: Department of Material and Technical Supply)</p> <p>The report is attached</p> |  |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--|

# **Implementation Report of 3<sup>rd</sup> TOT in Japan**

## **The Project for Establishment of the Combined Cycle Gas Turbine (CCGT) Operation and Maintenance Training Center (Trainer Course / Management Course)**

June 2018

**Japan International Cooperation Agency (JICA)**

**Asia Engineering Consultant Co., Ltd.**

**Nippon Koei Co., Ltd.**

**The Chugoku Electric Power Co., Inc.**

**Power Engineering and Training Services, Inc.**



## Table of Contents

|                                                                           |       |    |
|---------------------------------------------------------------------------|-------|----|
| 1. Outline of TOT                                                         | ..... | 1  |
| 2. Program of TOT in Japan                                                | ..... | 1  |
| 3. Trainer Participants                                                   | ..... | 6  |
| 4. Training Record & Evaluation<br>Comments                               | ..... | 7  |
| 5. Comments and evaluation of 3 <sup>rd</sup> TOT<br>in Japan by trainees | ..... | 29 |
| 6. Summary                                                                | ..... | 30 |
| 7. Acknowledgements                                                       | ..... | 30 |

Attachment-1 : Presentation materials by trainees - REPORT about the results of the work done on the training center of JSC “NAVOI TPP” -

Attachment-2 : Technical Transfer of The Project

## **1 . Outline of 3rd TOT (Training of Trainers)**

(1) Training Course Title

「The Project for Establishment of the Combined Cycle Gas Turbine (CCGT) Operation and Maintenance Training Center」 3rd Training of Trainers in Japan

(2) Training Period

Trainer Candidates Course: From 11 Mar. 2018 to 12 Apr. 2018

Management Course: From 20 Mar. 2018 to 29 Mar. 2018

(3) The numbers of Trainees/Participants

Trainer Candidates Course: 7 persons

Management Course: 1 person

(4) Training implementing agency

Power Engineering and Training Service, Inc.

Mitsubishi Hitachi Power Systems, Ltd

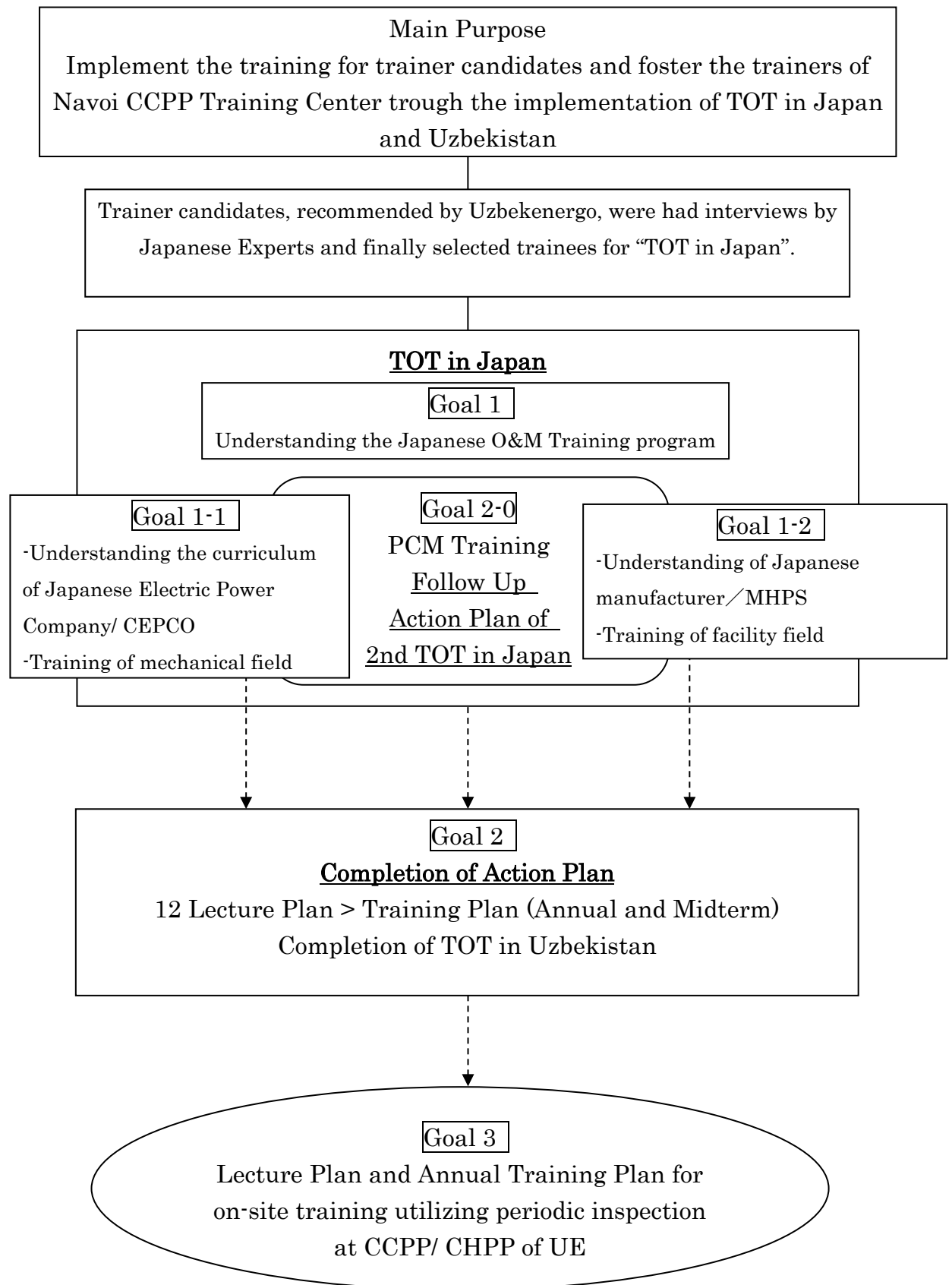
IC Net Limited

## **2 . Program of 3rd TOT in Japan**

Training program of trainer candidates in this project is composed of “Training of Trainers (TOT) in Japan”, “Implementation of TOT in Uzbekistan” and “Implementation on-site training by UE utilizing periodic inspection of combined cycle”. The whole concept of training program of TOT in Japan is shown in below.

Through TOT in Japan, trainees are expected to understand educational training program of Japanese electric power company, learn the basic knowledge of reviewing the Russian training materials which provided from Japanese experts, and after returning their country they reflect it to be effective.

“Implementation of TOT in Uzbekistan” and “Implementation on-site training by UE utilizing periodic inspection of combined cycle” will be done in accordance with the experience and knowledge which trainees are learned in this TOT in Japan.



— Figure 1 Concept of whole Training —

## (2) Training Schedule for trainer candidates &lt;Implemented result&gt;

— Table 1 Training Schedule (Trainer Candidates Course) —

| Date                             | Time                       | Training Curriculum                                                                                                                 | Lecturer                                | Site                                                                       | Target                      |
|----------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------|-----------------------------|
| 11-Mar (Sun)                     | 10:00-15:00                | Project Briefing                                                                                                                    | AEC<br>Akiko Sakuma                     | JICA<br>(Chugoku<br>International<br>Center)                               | Background<br>Understanding |
| 12-Mar<br>(Mon)                  | 09:00-12:00<br>13:00-16:00 | Program Orientation                                                                                                                 | JICA Chugoku                            |                                                                            |                             |
| 13-Mar (Tue)                     | 10:00-15:00                | PCM Method                                                                                                                          | IC-NET<br>Atsuyuki Kado                 |                                                                            | Goal 2-0                    |
| 14-Mar<br>(Wed)                  | 09:00-11:00                | PET: Orientation                                                                                                                    | PET<br>Shinya Ando                      | Power<br>Engineering<br>and Training<br>Services,<br>Incorporated<br>(PET) | Goal 1                      |
|                                  | 11:00-16:00                | Human Resource Development<br>for Japanese Thermal Power<br>Plant                                                                   | PET<br>Noboru Araki                     |                                                                            |                             |
| 15-Mar (Thu)                     | 09:00-16:00                | Introduction of Training Course<br>of PET                                                                                           | PET<br>Shohei Hasebe                    |                                                                            |                             |
| 16,19,20-Mar<br>(Fri / Mon/ Tue) | 09:00-16:00                | Vibration analysis for rotating<br>machine (Lecture / Practice)                                                                     | PET<br>Shohei Hasebe                    |                                                                            | Goal 1-1                    |
| 22,23-Mar<br>(Thu/Fri)           | 09:00-16:00                | Site-Tour of Yanai Power Plant                                                                                                      | PET<br>Yohei Miyamoto<br>Kouji Fukuyama | Yanai<br>Power<br>Plant                                                    | Goal 1-1                    |
|                                  |                            | Mock-UP Training ( Basic of<br>GT generation, Hot parts)                                                                            |                                         |                                                                            |                             |
| 26-Mar<br>(Mon)                  | 10:00-11:00                | Site-Tour of Central Load<br>Dispatching Office                                                                                     | PET<br>Shohei Hasebe                    | Chugoku<br>Electric<br>Power Co,<br>Inc.<br>(CEPCO)<br>Head<br>office      | Goal 1                      |
|                                  | 11:00-12:00                | Discussion with Power<br>Generation Div.                                                                                            | PET<br>Shohei Hasebe                    |                                                                            |                             |
| 27,28-Mar<br>(Tue /Wed)          | 09:00-16:00                | Site-Tour of Mizushima Power<br>Plant,<br>Mock-UP Training<br>(Non-destructive testing,<br>Remaining Life Assessment<br>Technology) | PET<br>Yohei Miyamoto<br>Kouji Fukuyama | Mizushima<br>Power<br>Plant                                                | Goal 1-1                    |
| 29-Mar<br>(Thu)                  | 9:00-12:00                 | MHPS Orientation<br>Site-Tour of Takasago Factory                                                                                   | MHPS<br>Hiroya Watanabe                 | MHPS<br>Takasago<br>Factory                                                | Goal 1-2                    |
|                                  | 13:00-16:00                | GT and Auxiliaries System                                                                                                           | MHPS Shikari<br>Swapankuma              |                                                                            |                             |
| 30-Mar<br>(Fri)                  | 9:00-12:00                 | P&I Diagram                                                                                                                         | MHPS<br>Shintaro Nonoaka                |                                                                            |                             |
|                                  | 13:00-16:00                | Hazardous Area,<br>Operation Procedure,<br>General Interlock                                                                        | MHPS<br>Robert Murphy                   |                                                                            |                             |

| Date                       | Time        | Training Curriculum                                      | Lecturer                             | Site          | Target   |
|----------------------------|-------------|----------------------------------------------------------|--------------------------------------|---------------|----------|
| 2-Apr<br>(Mon)             | 9:00-16:00  | GT and Auxiliaries System                                | MHPS: Shikari<br>Swapankuma          |               | Goal 1-2 |
| 3-Apr<br>(Tue)             | 9:00-10:30  | Blade Washing Device, etc.                               | MHPS<br>Kotaro Matsui                |               | Goal 1-2 |
|                            | 10:30-12:00 | Heat Exchanger                                           | Masahiko Ito                         |               |          |
|                            | 13:00-16:00 | General Description of<br>Instruction and Control System | Hiroataka Ishikawa<br>Norihisa Kishi |               |          |
| 4,5,6-Apr<br>(Wed/Thu/Fri) | 9:00-16:00  | GT Control System Operation<br>and Maintenance           | MHPS<br>Shoko Yamada                 |               | Goal 1-2 |
| 9-Apr (Mon)                | 9:00-16:00  | Design construction and<br>performance                   | MHPS<br>Yuka Takagi                  |               | Goal 1-2 |
| 10-Apr (Tue)               | 9:00-10:40  | Periodical Maintenance                                   | MHPS<br>Naoki Yamada                 |               | Goal 1-2 |
|                            | 10:50-11:55 | Periodical Maintenance                                   | MHPS<br>Hayato Nishizaki             |               |          |
|                            | 13:00-16:00 | GT Electrical & Control Package                          | MHPS<br>Yuto Matsui                  |               |          |
| 11-Apr<br>(Wed)            | 9:00-12:00  | GT Commissioning Procedure                               | MHPS<br>Yoshihito<br>Kobayashi       |               | Goal 1-2 |
| 12-Apr (Thu)               | 10:00-13:00 | Closing ceremony for 3rd<br>Training in Japan            | AEC<br>Takashi Saito                 | JICA<br>Tokyo | Goal 2-0 |

## (3) Training Schedule for management &lt;Implemented result&gt;

— Table 2 Training Schedule (Management Course) —

| Date            | Time        | Training Curriculum                                                                                                | Lecturer                                | Site                                                                  | Target                                    |
|-----------------|-------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------|-------------------------------------------|
| 20-Mar<br>(Tue) | 9:00-16:00  | Program Orientation                                                                                                | JICA Chugoku                            | JICA<br>(Chugoku<br>International<br>Center)                          |                                           |
| 21-Mar<br>(Wed) | 10:00-16:00 | Project Monthly Meeting                                                                                            | AEC<br>Wakabayasi<br>Hidehito           |                                                                       |                                           |
| 22-Mar<br>(Thu) | 09:00-12:00 | Project Briefing / Discussion                                                                                      | AEC<br>Takashi Saito                    |                                                                       | Background<br>Understanding<br>(Goal 2-0) |
| 23-Mar<br>(Fri) | 9:00-16:00  | Introduction of Training Course<br>of PET                                                                          | PET<br>Shohei Hasebe                    | PET                                                                   | Goal 1                                    |
| 26-Mar<br>(Mon) | 10:00-13:00 | Site-Tour of Central Load<br>Dispatching Office                                                                    | PET<br>Shohei Hasebe                    | Chugoku<br>Electric<br>Power Co,<br>Inc.<br>(CEPCO)<br>Head<br>office | Goal 1                                    |
|                 | 14:30-16:00 | Discussion with Power<br>Generation Div.                                                                           | PET<br>Shohei Hasebe                    |                                                                       |                                           |
| 27-Mar<br>(Tue) | 10:00-15:00 | Outline of management plan<br>Efforts to Stable Supply and<br>Strengthening Competitiveness<br>in Thermal Division | PET<br>Shohei Hasebe                    |                                                                       | Goal 1                                    |
| 28-Mar<br>(Wed) | 09:00-16:00 | Site-Tour of Mizushima Power<br>Plant<br>Mock-UP Training<br>(Non-destructive testing)                             | PET<br>Yohei Miyamoto<br>Kouji Fukuyama | Mizushima<br>Power<br>Plant                                           | Goal 1-1                                  |
| 29-Mar<br>(The) | 9:00-15:00  | MHPS Orientation<br>Site-Tour of Takasago Factory                                                                  | MHPS<br>Hiroya Watanabe                 | MHPS<br>Takasago<br>Factory                                           | Goal 1-2                                  |
|                 |             | GT and Auxiliaries System                                                                                          | MHPS Shikari<br>Swapankuma              |                                                                       |                                           |

### 3. Trainees

— Table 3 Participants of 3<sup>rd</sup> TOT in Japan —

| Participants Name                | Division                                     | Field      |
|----------------------------------|----------------------------------------------|------------|
| <b>Trainer Candidates Course</b> |                                              |            |
| Mr. TOSHOV Istam                 | Leading engineer Instrumentation and Control | C&I        |
| Mr. MAKHMUDOV Aziz               | Non-destructive worker 4th Range             | Mechanical |
| Mr. ESHEV Hamdam                 | Electrical Engineer                          | Electrical |
| Mr. ISLAMOV Ismail               | Maintenance Master                           | Mechanical |
| Mr. KHUDOYKULOV Lutfillo         | Operator GT                                  | Mechanical |
| Mr. BAZAROV Fakhridin            | Operator BOP                                 | Mechanical |
| Mr. PIRNAZAROV Nurali            | Local Operator Gas Compressor                | Mechanical |
| <b>Management Course</b>         |                                              |            |
| Mr. DOSTOV Shukhrat              | Director Navoi Training Center               | Director   |

#### 4. Training Record & Evaluation Comments of 7 Trainer candidates

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                   |                                                  |
|-----------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Date</b>                             |                                       | <b>11th Mar, 2018</b>                                                                                                                                                                                                                                                                                                             | <b>10 : 00~11 : 30</b><br><b>13 : 00~15 : 00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Ms. Akiko Sakuma / Asia Engineering Consultant Co., Ltd.                                                                                                                                                                                                                                                                          |                                                  |
| <b>Course (5-1)</b>                     |                                       | Project Briefing                                                                                                                                                                                                                                                                                                                  |                                                  |
| <b>Aim of Lecture</b>                   |                                       | The Comprehension of the whole of this project<br>Implementation items after TOT within the project period                                                                                                                                                                                                                        |                                                  |
| <b>Contents of Lecture</b>              |                                       | Outline of the project; Project Goal, Challenges and future implementation items                                                                                                                                                                                                                                                  |                                                  |
|                                         |                                       | Preparation for the establishment of the Navoi New Training Center ;<br>Lesson Plan, Training Plan and Accreditation System                                                                                                                                                                                                       |                                                  |
| <b>Lecturer's self evaluation</b>       |                                       | In order to encourage trainer candidates to understand that TOT is a part of whole this project activity, we introduced them the discussion matters with managers of Uzbekenergo and Navoi New Training center.                                                                                                                   |                                                  |
|                                         |                                       | We emphasized the importance of cooperation between trainer candidates and UE headquarters and managers of training centers for the future.                                                                                                                                                                                       |                                                  |
| <b>Trainees' evaluation by lecturer</b> |                                       | During the project briefing, the participants seemed to be concentrating. They understood the indicators of the project, the Lesson Plan, and the necessity of organizing the training courses in accordance with the training plan to be created in the future with the director of training center.                             |                                                  |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                           |                                                  |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                           |                                                  |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.57                                                                                                                                                                                                                                                                                           |                                                  |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                                                                                                                          |                                                  |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                                                                                                                                                                                                                                                        |                                                  |
|                                         |                                       | Useful to make Action Plan : Evaluation Score 4.00                                                                                                                                                                                                                                                                                |                                                  |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                             |                                                  |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                      |                                                  |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.71                                                                                                                                                                                                                                                                  |                                                  |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                                                                                          |                                                  |
|                                         | <b>Trainees' comments</b>             | <p>The presenter detailed the role and further operation of the project.</p> <p>The lesson was clear and understandable.</p> <p>The lesson was satisfying, the information was very useful, all the time of the study was planned and passed accurately according to plan. During the lesson, slides and examples were shown.</p> |                                                  |

\* The lecture was focused on the project activities within the remaining 1 year, especially of the collaboration with the managers of the training center.



|                                         |                                       |                                                                                                                                                                                                                                                                                                                           |                                          |
|-----------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <b>Date</b>                             |                                       | <b>13th Mar, 2018</b>                                                                                                                                                                                                                                                                                                     | <b>10:00~15:00</b><br><b>09:00~15:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr.Atsuyuki Kado<br>IC NET Limited /Consultant Facilitator                                                                                                                                                                                                                                                                |                                          |
| <b>Course (5-2)</b>                     |                                       | PCM Method                                                                                                                                                                                                                                                                                                                |                                          |
| <b>Aim of Lecture</b>                   |                                       | Understand the PCM Method and PDM.                                                                                                                                                                                                                                                                                        |                                          |
| <b>Contents of Lecture</b>              |                                       | Explanation of Introduction to PCM, problem analysis / purpose analysis, extraction of project activities.                                                                                                                                                                                                                |                                          |
| <b>Lecturer's self evaluation</b>       |                                       | The trainees were motivated and aggressive, the participatory training was done. In order to understand PDM, I tried to deepen the understanding of PDM of their projects, using the case study. The lecture was able to operate smoothly and on time.                                                                    |                                          |
| <b>Trainees' evaluation by lecturer</b> |                                       | Throughout the whole lecture, participants actively participated and cooperated in many occasions. Since the lecture was progressing faster than planned, it was possible to carry out the purpose analysis etc. scheduled to be omitted.                                                                                 |                                          |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                   |                                          |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                   |                                          |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                   |                                          |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                                                                                  |                                          |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                |                                          |
|                                         |                                       | Useful to make Action Plan Evaluation Score 4.00                                                                                                                                                                                                                                                                          |                                          |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                     |                                          |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                                                                                                                                              |                                          |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.43                                                                                                                                                                                                                                                          |                                          |
|                                         |                                       | Effective for reviewing Russian training materials. 3.43                                                                                                                                                                                                                                                                  |                                          |
|                                         | <b>Trainees' comments</b>             | I really liked the method of conducting the lesson and planning the time. this all indicates the literacy of the teacher and how should be the future instructor.<br><br>To be honest, I really liked the lesson, especially the practical part was wonderful<br><br>I think this knowledge will be very necessary to us. |                                          |

\* Regarding the participatory training on PDM methods / logic, questionnaire evaluation was very high.

\* Because trainees' understanding was very earlier, we had a time to explain the purpose analysis which was not planned original.

| Date                                    |                                       | 14th Mar, 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 9 : 00~11:00<br>11:00~16:00 |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Hiroshi Shimada / PET, PRESIDENT<br>Mr. Kouji Fujii / PET, General Manager<br>Mr. Shinji Fujimoto / PET, Deputy General Manager<br>Mr. Noboru Araki / PET, Technical Training Dept. Senior Manager<br>Mr. Yohei Miyamoto / PET, Engineering Dept. Senior Manager<br>Mr. Shohei Hasebe / PET, Technical Training Dept. Planning & Administration Group Chief Manager<br>Mr. Yohei Okamoto / PET, Technical Training Dept. Mechanical Group<br>Mr. Shinya Ando / PET, Technical Training Dept. Planning &<br>Mr. Kouji Fukuyama / PET, Technical Training Dept. Mechanical Group<br>Mr. Hikaru Iwai / PET, Technical Training Dept. Planning & |                             |
| <b>Course (5-3)</b>                     |                                       | Orientation and /Human Resource Development in thermal power plant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |
| <b>Aim of Lecture</b>                   |                                       | Contents of implemented training / Acquisition of ideas of human resource development of thermal power plants in CEPCO and role of training center                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |
| <b>Contents of Lecture</b>              |                                       | Welcome greetings, Self-introduction of trainees and attendees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                         |                                       | The introduction of CEPCO and PET and Flow of Employee Education of Chugoku Electric Power Co.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                         |                                       | The role of PET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |
| <b>Lecturer's self evaluation</b>       |                                       | Human resource development training was a reference for participants by showing concrete examples of Japanese style education.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
| <b>Trainees' evaluation by lecturer</b> |                                       | Participants worked diligently and showed high interest in training human resources in Japan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |
|                                         |                                       | Useful to make Action Plan Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |
|                                         |                                       | Effective for reviewing Russian training materials. 3.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |
|                                         | <b>Trainees' comments</b>             | I think that the knowledge of training in the Japanese energy company is very important.<br>Training center "PET" is very well organized. I think that all teachers are kind and highly qualified.<br>This lecture will help me become a good instructor.<br>Despite a number of advantages of listening to the lecture and the lecturer, there are also some suggestions that may be useful for further application to study this course.                                                                                                                                                                                                       |                             |

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                                                    |                   |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>15th Mar, 2018</b>                                                                                                                                                                                                                                                                                                                                              | <b>9:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Shohei Hasebe / PET, Technical Training Dept. Planning & Administration Group Chief Manager<br>Mr. Hiroaki Tsujino / PET, Technical Training Dept. Electrical control<br>Mr. Shinji Fujimoto / PET, Deputy General Manager<br>Mr. Kiyoshi Tamura / PET, Technical Training Dept. Operation Group<br>Mr. Shinya Ando / PET, Technical Training Dept. Planning & |                   |
| <b>Course (5-4)</b>                     |                                       | Training introduction of power company (machine, electric control, power generation)                                                                                                                                                                                                                                                                               |                   |
| <b>Aim of Lecture</b>                   |                                       | In order to work as a trainers at Navoi Training Center, learn and refer to the training course and facilities in Japanese power plant.                                                                                                                                                                                                                            |                   |
| <b>Contents of Lecture</b>              |                                       | Introduction of training contents and equipment in electric control                                                                                                                                                                                                                                                                                                |                   |
|                                         |                                       | Introduction of training contents and equipment in power generation                                                                                                                                                                                                                                                                                                |                   |
|                                         |                                       | Introduction of training contents and equipment in mechanical                                                                                                                                                                                                                                                                                                      |                   |
| <b>Lecturer's self evaluation</b>       |                                       | Since we took sufficient time to visit the facilities, the participants were satisfied. Through equipment tours, they were able to imagine concretely the image of training in Japan.                                                                                                                                                                              |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | They learned extremely aggressively.                                                                                                                                                                                                                                                                                                                               |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                                                            |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                                                            |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                                                            |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                                                                                                                           |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                         |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.86                                                                                                                                                                                                                                                                                                                   |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                                                              |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                       |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 4.00                                                                                                                                                                                                                                                                                                   |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                                                                                                                           |                   |
|                                         | <b>Trainees' comments</b>             | The lesson was very fruitful, the teacher has a lot to learn. I especially liked the stands in all directions and the training equipment. I think that the ideal training center should be that way.<br>Today's lesson was good in practice and we learned new equipment for studying.                                                                             |                   |

\* Through the introduction of each training course and tour of the facility, trainees had a good suggestion for the Navoi new training center.

|                                         |                                       |                                                                                                                                             |                                                             |
|-----------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Date</b>                             |                                       | <b>16th,19th 20th Mar, 2018</b>                                                                                                             | <b>9:00～16:00</b><br><b>9:00～16:00</b><br><b>9:00～16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Shohei Hasebe / PET, Technical Training Dept. Planning & Administration Group Chief Manager                                             |                                                             |
| <b>Course (5-5)</b>                     |                                       | Training of power company<br>Vibration basic technology lecture and practical training                                                      |                                                             |
| <b>Aim of Lecture</b>                   |                                       | Learn the content of training transferred to technology in project                                                                          |                                                             |
| <b>Contents of Lecture</b>              |                                       | Lecture : Using the Video material (English) and text                                                                                       |                                                             |
|                                         |                                       | Practical Training : Vibration measurement using model rotor, balancing and congirmation of vibration phenomenon.                           |                                                             |
| <b>Lecturer's self evaluation</b>       |                                       | Taking time to discuss with prticipants led to the promotion of the understanding of all.                                                   |                                                             |
| <b>Trainees' evaluation by lecturer</b> |                                       | They were very enthusiastic and concentrated on all the time.                                                                               |                                                             |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                     |                                                             |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                     |                                                             |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 4.00                                                                                                     |                                                             |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                    |                                                             |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                  |                                                             |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.86                                                                                            |                                                             |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                       |                                                             |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                |                                                             |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.71                                                                            |                                                             |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                    |                                                             |
|                                         | <b>Trainees' comments</b>             | I liked how the teacher teaches and answers the emerging questions of instructors. And he explained such a difficult lesson with such ease. |                                                             |
|                                         |                                       | The teacher knows his specialty very well. I will remember his lessons and use them in the future.                                          |                                                             |

\* It was the first time to implement the TOT of vibration analysis training using equipment, and trainees are seemed to cooperate each other.

\* The Russian translation of text was not fully completed, there were some difficulties to understand.

\* A lecture using video materials which is to be delivered to Uzbekistan was also conducted, it led and promoted the image of the TOT for trainees.

\* The experience of the practical training is expected to utilize the TOT in Uzbekistan near the future.

|                                         |                                       |                                                                                                                                                                                                                                |                                        |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Date</b>                             |                                       | <b>22th 23th Mar, 2018</b>                                                                                                                                                                                                     | <b>9:00~16:00</b><br><b>9:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Kouji Fukuyama / PET, Technical Training Dept. Mechanical Group<br>Mr. Yohei Miyamoto / PET, Engineering Dept. Senior Manager                                                                                              |                                        |
| <b>Course (5-6)</b>                     |                                       | Combined cycle power generation technology<br>(Yanai Power Station)                                                                                                                                                            |                                        |
| <b>Aim of Lecture</b>                   |                                       | On-site visit of CCPP and mock-training of GT power generation basic and hot parts                                                                                                                                             |                                        |
| <b>Contents of Lecture</b>              |                                       | Introduction for Yanai Power Station facility                                                                                                                                                                                  |                                        |
|                                         |                                       | Mock-Trainiang of text No.4 & No.5                                                                                                                                                                                             |                                        |
|                                         |                                       | Feedback and additional explanation of mock-training (ex. Difference between GT and CCPPe)                                                                                                                                     |                                        |
|                                         |                                       | Site tour ;Equipment during periodic inspection and combustor inspection, central control room, etc.                                                                                                                           |                                        |
|                                         |                                       | Discussion with Yanai Power Plant Engineeres                                                                                                                                                                                   |                                        |
| <b>Lecturer's self evaluation</b>       |                                       | We were able to confirm the decomposition of periodic inspection facility (No. 2 GE: 7 F) and combustor inspection facility (No. 1 No. 1 Hitachi: H 100) at the worksit.                                                       |                                        |
| <b>Trainees' evaluation by lecturer</b> |                                       | I was able to answer many questions of the trainees.                                                                                                                                                                           |                                        |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                        |                                        |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                        |                                        |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                        |                                        |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                       |                                        |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                                                                                                                                                     |                                        |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.57                                                                                                                                                                               |                                        |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                                                                                                                                                          |                                        |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                                                   |                                        |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.57                                                                                                                                                               |                                        |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                       |                                        |
|                                         | <b>Trainees' comments</b>             | We visited the plant not only by the principles of the CCGT operation of other modifications and manufacturers, but also acquired experience and skills in the design and technical characteristics of the operated equipment. |                                        |

\* Trainees seemed very interactively on the site tour of the periodic inspection.

\* They also actively participated in the simulated lecture.

\* JET would like to expect that trainer candidates make the new course of on-site training in Uzbekistan.

| Date                                |                                      | 26th Mar, 2018                                                                                                                                                                                             | 10:00～12:00 |
|-------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Lecturer<br>Name/Affiliation        |                                      | Mr. Eiji Yamamoto / CEPCO,Director of Distribution and Distribution Company Central Power Supply Director Section Manager                                                                                  |             |
|                                     |                                      | Mr. Takanori Shuto / CEPCO, Deputy Director of Central Power Supply Directive and Distribution Company                                                                                                     |             |
|                                     |                                      | Mr. Masaharu Murata / CEPCO,Head of Thermal Power Division, Power Supply Division                                                                                                                          |             |
|                                     |                                      | Mr. Haruhito Kubota / CEPCO Group Manager, Thermal Power Plant, Power Supply Division                                                                                                                      |             |
|                                     |                                      | Mr. Masashi Murata / CEPCO, Power Business Division Thermal Power Plant Planning Group                                                                                                                     |             |
| Course (5-7)                        |                                      | Visit to Central Supply Order Office and Thermal Division                                                                                                                                                  |             |
| Aim of Lecture                      |                                      | Understanding the current state of system operation of Japanese electric company & Discussion with thermal division staff                                                                                  |             |
| Contents of Lecture                 |                                      | The role of Central Supply Order Office                                                                                                                                                                    |             |
|                                     |                                      | Situation of the thermal power division・On future direction                                                                                                                                                |             |
| Lecturer's self<br>evaluation       |                                      | It was meaningful in learning the actual power supply operation situation of Japanese power companies.                                                                                                     |             |
|                                     |                                      | In Japan, it was urged to reduce CO2 emissions and increase the proportion of non-fossil fuels urgently.                                                                                                   |             |
| Trainees' evaluation by<br>lecturer |                                      | They were very interested in the power generation cost by fuel type, including sunlight, nuclear power and positively asked questions.                                                                     |             |
|                                     |                                      | They were always polite, expressing respectful relationships.                                                                                                                                              |             |
| Evaluation by trainees              | Contents                             | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                    |             |
|                                     | Amount                               | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                    |             |
|                                     | Time                                 | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                    |             |
|                                     | Comprehension                        | Evaluation Score (7 people average) 3.86                                                                                                                                                                   |             |
|                                     | Acquired<br>knowledge and<br>ability | Acquired knowledge : Evaluation Score 3.71                                                                                                                                                                 |             |
|                                     |                                      | Useful to make Action Plan Evaluation Score 3.71                                                                                                                                                           |             |
|                                     |                                      | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                      |             |
|                                     |                                      | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                               |             |
|                                     |                                      | Effective for considering equipment lists: evaluation point 3.57                                                                                                                                           |             |
|                                     |                                      | Effective for reviewing Russian training materials. 3.71                                                                                                                                                   |             |
|                                     | Trainees'<br>comments                | Meeting with the management of the power system and getting to know the functions of the dispatching service, the representative of the activity of the power system of the Tyugoku electric is exhausted. |             |

\* There were many questions about Japan's electricity charge service system and power generation other than thermal power generation.

\* They understood the difference of system between Japan and Uzbekistan by the response from Japanese side.

|                                         |                                       |                                                                                                                                                                                                                                                                                                            |                                        |
|-----------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Date</b>                             |                                       | <b>27th, 28th Mar, 2018</b>                                                                                                                                                                                                                                                                                | <b>9:00~16:00</b><br><b>9:00~15:30</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Yohei Miyamoto / PET, Engineering Dept. Senior Manager<br>Mr. Shohei Hasebe / PET, Technical Training Dept. Planning & Administration Group Chief Manager<br>Mr. Yohei Okamoto / PET, Technical Training Dept. Mechanical Group<br>Mr. Kouji Fukuyama / PET, Technical Training Dept. Mechanical Group |                                        |
| <b>Course (5-8)</b>                     |                                       | Combined cycle power generation technology<br>(Mizushima Power Station)                                                                                                                                                                                                                                    |                                        |
| <b>Aim of Lecture</b>                   |                                       | On-site visit of CCPP and mock-training of Non-destructive inspection · remaining life diagnosis                                                                                                                                                                                                           |                                        |
| <b>Contents of Lecture</b>              |                                       | Introduction of Mizushima Power Plant facility                                                                                                                                                                                                                                                             |                                        |
|                                         |                                       | Mock-Trainiang of text No.1 & No.3                                                                                                                                                                                                                                                                         |                                        |
|                                         |                                       | Feedback and additional explanation of mock-training                                                                                                                                                                                                                                                       |                                        |
|                                         |                                       | Site tour ;Equipment of the M501F3 which is the same series as the Navoi power plant, central control room, spare parts warehouse etc.)                                                                                                                                                                    |                                        |
|                                         |                                       | Discussion with Mizushima Power Plant Engineeres                                                                                                                                                                                                                                                           |                                        |
| <b>Lecturer's self evaluation</b>       |                                       | I was able to explain in response to the trainee's interests such as arrangement of fuel valves and control sensors.                                                                                                                                                                                       |                                        |
| <b>Trainees' evaluation by lecturer</b> |                                       | They were struggling with technical terms but positively asked questions with the help of an interpreter.                                                                                                                                                                                                  |                                        |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                    |                                        |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                    |                                        |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                    |                                        |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                                                                   |                                        |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.71                                                                                                                                                                                                                                                                 |                                        |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.71                                                                                                                                                                                                                                                           |                                        |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.71                                                                                                                                                                                                                                      |                                        |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                                                                                                                               |                                        |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                                                                           |                                        |
|                                         |                                       | Effective for reviewing Russian training materials. 3.86                                                                                                                                                                                                                                                   |                                        |
|                                         | <b>Trainees' comments</b>             | Sharing experience with the plant staff is very important for us.<br>We compared fuel: gas and coal, from view of poitin of comfortable and economically.                                                                                                                                                  |                                        |

\* Trainees highly interested in the spare parts management and air filters.

\* They were surprised that troubles were hardly happened in Japanese power plant, because a Japanese engineer answered that last trouble case was happened about twenty years ago.

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                                                                           |                                         |
|-----------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>Date</b>                             |                                       | <b>29th Mar, 2018</b><br><b>3rd Apr, 2018</b>                                                                                                                                                                                                                                                                                                                                             | <b>9:00~12:00</b><br><b>16:00-16:50</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Hiroya Watanabe / MHPS, Takasago Service Divison                                                                                                                                                                                                                                                                                                                                      |                                         |
| <b>Course (5-9)</b>                     |                                       | Manufacturer training ; MHPS opening ceremony and Factory tour                                                                                                                                                                                                                                                                                                                            |                                         |
| <b>Aim of Lectur</b>                    |                                       | MHPS opening ceremony and Factory tour                                                                                                                                                                                                                                                                                                                                                    |                                         |
| <b>Contents of Lecture</b>              |                                       | Introduction of Takasagao Facility                                                                                                                                                                                                                                                                                                                                                        |                                         |
| <b>Lecturer's self evaluation</b>       |                                       | To explaine the flow of development, design, manufacture and verification of gas turbine and visited our factory/                                                                                                                                                                                                                                                                         |                                         |
|                                         |                                       | To explaine about the remote monitoring center and training facility for human resource development and visit to there later due to time constraints.                                                                                                                                                                                                                                     |                                         |
| <b>Trainees' evaluation by lecturer</b> |                                       | There were various questions and we are glad to know that trainees were interested in with good understanding.                                                                                                                                                                                                                                                                            |                                         |
|                                         |                                       | After visiting the factory, there was some request to see other factory. We explained them that it required authorization in advance and they understood.                                                                                                                                                                                                                                 |                                         |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                                                   |                                         |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                                                   |                                         |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                                                                                                                                                                                   |                                         |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                                                                                                                                                                                  |                                         |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                                |                                         |
|                                         |                                       | Useful to make Action Plan Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                                          |                                         |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                     |                                         |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                                              |                                         |
|                                         |                                       | Effective for considering equipment lists: evaluation point 4.00                                                                                                                                                                                                                                                                                                                          |                                         |
|                                         |                                       | Effective for reviewing Russian training materials. 3.86                                                                                                                                                                                                                                                                                                                                  |                                         |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>• Excursion to one of the world's leading factories for the manufacture of gas turbines (MHPS) left a maximum of a passive impression. The organizational event was carried out at a high level.</li> <li>• The teacher explained his lesson very clearly. Excursions we really liked, but the time was VERY SMALL for familiarization.</li> </ul> |                                         |

\* Almost all trainees felt that the factory site tour time was too short. They seemed high interested in.

\* The award of manager's certificate was done by JICA after factory tour.



|                                         |                                       |                                                                                                                                                                                                                         |                   |
|-----------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>30th Mar, 2018</b>                                                                                                                                                                                                   | <b>9:00~12:00</b> |
| <b>Lecturer Name/Affiliation)</b>       |                                       | Mr. Shintaro Nonaka / MHPS, Plant Engineering Department Plant Design Division                                                                                                                                          |                   |
| <b>Course (5-10)</b>                    |                                       | P&I Diagram                                                                                                                                                                                                             |                   |
| <b>Aim of Lecture</b>                   |                                       | To explain the fuel and air system on P&I Diagram                                                                                                                                                                       |                   |
| <b>Contents of Lecture</b>              |                                       | Fuel gas system                                                                                                                                                                                                         |                   |
|                                         |                                       | Bleed / cooling system                                                                                                                                                                                                  |                   |
|                                         |                                       | Anti-icing system                                                                                                                                                                                                       |                   |
| <b>Lecturer's self evaluation</b>       |                                       | I was able to answer all the questions in this lecture                                                                                                                                                                  |                   |
|                                         |                                       | All the trainees fully understood this training.                                                                                                                                                                        |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | There were also specific questions from trainees who have plant operation experience .                                                                                                                                  |                   |
|                                         |                                       | The trainees taught the unknown part each other.                                                                                                                                                                        |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                 |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                 |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                 |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                              |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.57                                                                                                                                                                        |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                   |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.57                                                                                                                                                            |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.57                                                                                                                                                        |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.57                                                                                                                                                                |                   |
|                                         | <b>Trainees' comments</b>             | • We are well aware of fire safety and equipment malfunctions and signals.<br>• A lecture by Mr. Nonaka on the topic "PID diagramm, dangerous zone (premises and equipment of CCGT) and interlock" is learnt very well. |                   |

|                                         |                                       |                                                                                                                                                                                                                                 |                    |
|-----------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Date</b>                             |                                       | <b>2018/3/30</b>                                                                                                                                                                                                                | <b>13:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Robert Murphy / MHPS, Plant Engineering Department Plant Design Division                                                                                                                                                        |                    |
| <b>Course (5-10)</b>                    |                                       | Hazardous Area, Operation Procedure, General Interlock                                                                                                                                                                          |                    |
| <b>Aim of Lecture</b>                   |                                       | To explain plant operation, interlock and explosion proof policy                                                                                                                                                                |                    |
| <b>Contents of Lecture</b>              |                                       | Plant operation: explanation of plant start and stop                                                                                                                                                                            |                    |
|                                         |                                       | Interlock                                                                                                                                                                                                                       |                    |
|                                         |                                       | Explosion-proof:                                                                                                                                                                                                                |                    |
| <b>Lecturer's self evaluation</b>       |                                       | I could answer all the questions, I think they got a good and enough understanding.。                                                                                                                                            |                    |
|                                         |                                       | The training was exceeded about 10 minutes.                                                                                                                                                                                     |                    |
| <b>Trainees' evaluation by lecturer</b> |                                       | Since there were some trainees who had experience of plant operation, I felt that their understanding was fast                                                                                                                  |                    |
|                                         |                                       | I felt trainees positively confirmed their questions and joined this training eagerly.                                                                                                                                          |                    |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                         |                    |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                         |                    |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                         |                    |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                        |                    |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                      |                    |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.57                                                                                                                                                                                |                    |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                           |                    |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.57                                                                                                                                                                    |                    |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.57                                                                                                                                                                |                    |
|                                         |                                       | Effective for reviewing Russian training materials. 3.57                                                                                                                                                                        |                    |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>•Especially I learned about lessons about hazardous areas of GT.</li> <li>•The teacher knows his specialty very well. I will remember his lessons and use them in the future.</li> </ul> |                    |

\* There were some comments that trainees could learned from lecturer's experience and ability, while others felt there was short time to understand.

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>Date</b>                             |                                       | <b>29th Mar, 2018</b><br><b>2nd Apr, 2018</b>                                                                                                                                                                                                                                                                                                                                        | <b>13:00~16:00</b><br><b>9:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Shikari Swapankumar / MHPS, Gas turbine equipment design division                                                                                                                                                                                                                                                                                                                    |                                         |
| <b>Course (5-11)</b>                    |                                       | GT and Auxiliaries System                                                                                                                                                                                                                                                                                                                                                            |                                         |
| <b>Aim of Lecture</b>                   |                                       | To explain GT Auxiliaries System, Equipment, function, intermtation and control.                                                                                                                                                                                                                                                                                                     |                                         |
| <b>Contents of Lecture</b>              |                                       | Following System completed perfectly as per the Training Slides/manuals in the training database..<br>(1) GT Air Intake System.<br>(2) CO2 Fire Fighting System<br>(3) GT Enclosure and Ventilation System.                                                                                                                                                                          |                                         |
|                                         |                                       | Following system needed additional training slides byeond the those available in training manual in the database.<br>(1) LO system additional slides needed to explain the Pressure and Temperature control settings.<br>(2) CO System, additional Slides needed to explain the Trip Valve unit and Pressure control setting of CO system.                                           |                                         |
|                                         |                                       | GT Exhaust Bypass Damper and Bypass Silencer & Stack could not be discussed because of less times and it was additional item for other plant.                                                                                                                                                                                                                                        |                                         |
| <b>Lecturer's self evaluation</b>       |                                       | I grade my performance as 9 out 10 (90%).                                                                                                                                                                                                                                                                                                                                            |                                         |
|                                         |                                       | All question of the customer (trainees) coulde answered and explained upto the satisfaction of the trainees.                                                                                                                                                                                                                                                                         |                                         |
| <b>Trainees' evaluation by lecturer</b> |                                       | 9 out of 10 (90%).                                                                                                                                                                                                                                                                                                                                                                   |                                         |
|                                         |                                       | Trainees could grasp well. They interacted well by theirs question of really good quality.                                                                                                                                                                                                                                                                                           |                                         |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                                                                                                              |                                         |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.57                                                                                                                                                                                                                                                                                                                                              |                                         |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                                                                                                                                                                              |                                         |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.71                                                                                                                                                                                                                                                                                                                                             |                                         |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.71                                                                                                                                                                                                                                                                                                                                           |                                         |
|                                         |                                       | Useful to make Action Plan Evaluation Score 3.29                                                                                                                                                                                                                                                                                                                                     |                                         |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.71                                                                                                                                                                                                                                                                                                                |                                         |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.71                                                                                                                                                                                                                                                                                                                         |                                         |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.43                                                                                                                                                                                                                                                                                                                     |                                         |
|                                         |                                       | Effective for reviewing Russian training materials. 3.00                                                                                                                                                                                                                                                                                                                             |                                         |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>• We have today learned the fire alarm system, how it works, what its property is and what actions it does in the event of a fire.</li> <li>• The lecturer acquainted in detail with the details of these equipments. The lecturer showed great practical experience in operation and design work when designing new power plants.</li> </ul> |                                         |

|                                         |                                       |                                                                                                                                                                                                                              |                   |
|-----------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>3rd Apr, 2018</b>                                                                                                                                                                                                         | <b>9:00~10:30</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Kotaro Matsui / MHPS, Plant Engineering Department Plant Design Division                                                                                                                                                 |                   |
| <b>Course (5-12)</b>                    |                                       | Blade Washing Device, etc.                                                                                                                                                                                                   |                   |
| <b>Aim of Lecture</b>                   |                                       | To explain other system on P&I Diagram                                                                                                                                                                                       |                   |
| <b>Contents of Lecture</b>              |                                       | Explained the outline of purpose and operation method etc. for the following three devices                                                                                                                                   |                   |
|                                         |                                       | •GT Casing Cooling Fan                                                                                                                                                                                                       |                   |
|                                         |                                       | •GT Compressor Blade Washing Device                                                                                                                                                                                          |                   |
|                                         |                                       | •Fuel Gas Last Chance Net Skid                                                                                                                                                                                               |                   |
| <b>Lecturer's self evaluation</b>       |                                       | I could answer all questions in the training.                                                                                                                                                                                |                   |
|                                         |                                       | The training was exceeded about 5 minutes.                                                                                                                                                                                   |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | Since there were some trainees who had experience of plant operation, I felt that their understanding of our explanation was fast                                                                                            |                   |
|                                         |                                       | They positively confirmed questions and joined this training eagerly.                                                                                                                                                        |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                      |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                      |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                      |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                     |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                   |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 4.00                                                                                                                                                                           |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                        |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                 |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                             |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                     |                   |
|                                         | <b>Trainees' comments</b>             | •The lecture on the topic "Blade washing devices" covered sufficient information on this direction. Listeners received a full information on the methods of cleaning the compressor blades in both online and offline modes. |                   |

\* There were many comments that they learned much from the lecturer's high expertise and experience.

|                                         |                                       |                                                                                                                                                                                                                         |                    |
|-----------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Date</b>                             |                                       | <b>3rd Apr, 2018</b>                                                                                                                                                                                                    | <b>10:30~12:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Masahiko Ito / MHPS,Heat Exchanger Design Division                                                                                                                                                                  |                    |
| <b>Course (5-12)</b>                    |                                       | Heat Exchanger                                                                                                                                                                                                          |                    |
| <b>Aim of Lecture</b>                   |                                       | To explain the structure, operation, maintenance etc. of the heat exchanger.                                                                                                                                            |                    |
| <b>Contents of Lecture</b>              |                                       | Explained the air-cooled heat exchanger TCA Cooler with FGH(Fuel Gas Heater). We believe that we could give trainees a good understanding of structure, operation and maintenance on this training.                     |                    |
|                                         |                                       | Explained Air cooling condenser for Navoi 2. and we had many questions and we could help them for their good understanding.                                                                                             |                    |
| <b>Lecturer's self evaluation</b>       |                                       | We had a additional training/question time on another day and we think that they understood the basic well. (Additional trainig were held later)                                                                        |                    |
| <b>Trainees' evaluation by lecturer</b> |                                       | Their Q & A was aggressive.                                                                                                                                                                                             |                    |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                 |                    |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                 |                    |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                 |                    |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                |                    |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                              |                    |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 4.00                                                                                                                                                                      |                    |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                   |                    |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                            |                    |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                        |                    |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                |                    |
|                                         | <b>Trainees' comments</b>             | •The lecture on the heat exchangers and the device for washing the blades of the GT compressor was carried out at a high level. I think it would be nice if you would give an emphasis on more relevant topics to date. |                    |

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                  |                    |
|-----------------------------------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Date</b>                             |                                       | <b>3rd Apr, 2018</b>                                                                                                                                                                                                                                                                                                             | <b>13:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Hirotaka Ishikawa / MHPS, Takasago Instrument Control and Design Division                                                                                                                                                                                                                                                    |                    |
|                                         |                                       | Mr. Norihisa Kishi / MHPS Engineering, C&I Group                                                                                                                                                                                                                                                                                 |                    |
| <b>Course (5-12)</b>                    |                                       | General Description of Instruction and Control System                                                                                                                                                                                                                                                                            |                    |
| <b>Aim of Lecture</b>                   |                                       | Understanding of MHPS GT control system and GT control overview                                                                                                                                                                                                                                                                  |                    |
| <b>Contents of Lecture</b>              |                                       | Outline of the overall MHPS GT control system                                                                                                                                                                                                                                                                                    |                    |
|                                         |                                       | Outline of the equipment that contains in the GT control system                                                                                                                                                                                                                                                                  |                    |
|                                         |                                       | Outline of fuel control system of GT                                                                                                                                                                                                                                                                                             |                    |
|                                         |                                       | Demonstration of GT start and stop operation by using simulator                                                                                                                                                                                                                                                                  |                    |
| <b>Lecturer's self evaluation</b>       |                                       | I think that their understanding has deepened by actual graphic and calculated value on the simulator.                                                                                                                                                                                                                           |                    |
| <b>Trainees' evaluation by lecturer</b> |                                       | Attitude to understand our control system was very good.                                                                                                                                                                                                                                                                         |                    |
|                                         |                                       | There were some trainees who had experience in actual operation asked many question that they have had so far and I felt their understanding were fast.                                                                                                                                                                          |                    |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                          |                    |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                          |                    |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                          |                    |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                                                                                                                         |                    |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                       |                    |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 4.00                                                                                                                                                                                                                                                                               |                    |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                                                                                            |                    |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                     |                    |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                                                                                                 |                    |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                                                                                         |                    |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>• This instructor provided me very important information about Remote monitoring centre.</li> <li>• The presented extensive information on the system of control and management of GT served as practical answers to many previously arisen in the course of operation issues.</li> </ul> |                    |

|                                         |                                       |                                                                                                                                                                                                                                                                 |                   |
|-----------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>4th- 6th Apr, 2018</b>                                                                                                                                                                                                                                       | <b>9:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Ms. Shoko Yamada / MHPS Control System, Chief of Netmation Technology                                                                                                                                                                                           |                   |
| <b>Course (5-13)</b>                    |                                       | GT Control System Operation and Maintenance                                                                                                                                                                                                                     |                   |
| <b>Aim of Lecture</b>                   |                                       | GT control system : System configuration of DIASYS Netmation, functional specification of major functions, operation method / How to change HW, signal definition or logic / Initial operation at trouble occurrence / Function of A-CPFM                       |                   |
| <b>Contents of Lecture</b>              |                                       | Diasys Netmation (Overview, OPS, EMS, Maintenance, A-CPFM)                                                                                                                                                                                                      |                   |
| <b>Lecturer's self evaluation</b>       |                                       | By using training PC that were customized for this training , they could operate it by themselves. I think their understood is enough to achieve the target of this training.                                                                                   |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | Everyone was very happy for training. Trainees who are not I&C nor operator were also properly operating the PC. Also, they were taking a note and take pictures on whiteboard                                                                                  |                   |
|                                         |                                       | Sometimes trainees taught and talked with each other, this kind of training circumstance makes their under understanding deeper.                                                                                                                                |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                         |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                         |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                         |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 4.00                                                                                                                                                                                                                        |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                      |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 4.00                                                                                                                                                                                                              |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 4.00                                                                                                                                                                                           |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                    |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                                |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.86                                                                                                                                                                                                        |                   |
|                                         | <b>Trainees' comments</b>             | ・I learned a lot of useful information from these lessons and I also liked the training simulator. I want to sincerely say thanks to the teacher!<br>・I learned that without logic we can not manage such equipment as a gas turbine. The lesson was wonderful. |                   |

\* Throughout the course of this training, this lecture was the highest evaluation from the trainees was.

\* It seemed that they wished to learn more for the future.

|                                         |                                       |                                                                                                                                                                                                                                                                                            |                                   |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>Date</b>                             |                                       | <b>9th Apr, 2018</b>                                                                                                                                                                                                                                                                       | <b>10:00~16:00<br/>9:00~12:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Ms. Yuka Takagi / MHPS, Large gas turbine engineering department plan Group                                                                                                                                                                                                                |                                   |
| <b>Course (5-14)</b>                    |                                       | Design construction and performance                                                                                                                                                                                                                                                        |                                   |
| <b>Aim of Lecture</b>                   |                                       | Deepen understanding of the main structure of MHPS gas turbine                                                                                                                                                                                                                             |                                   |
| <b>Contents of Lecture</b>              |                                       | Basic structure of gas turbine, definition of performance and efficiency, and temperature characteristics                                                                                                                                                                                  |                                   |
|                                         |                                       | Details of the structure, function and characteristics of each part of the gas turbine                                                                                                                                                                                                     |                                   |
| <b>Lecturer's self evaluation</b>       |                                       | I could explain the basic structure of the gas turbine and the definitions of performance and efficiency etc.                                                                                                                                                                              |                                   |
|                                         |                                       | Some questions could not be answered right away, but it seemed that trainees were almost satisfied. (Later all questions were answered)                                                                                                                                                    |                                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | Trainees taught each other, and they were trying to their understanding deeper.                                                                                                                                                                                                            |                                   |
|                                         |                                       | Based on their actual operation experience, they listened to the training and asked many questions.                                                                                                                                                                                        |                                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                    |                                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                                                    |                                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                                                                                    |                                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                                                   |                                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                                                                                                                                                                                                                 |                                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 3.86                                                                                                                                                                                                                                         |                                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                                                                                                                                                                                                                      |                                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                               |                                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 4.00                                                                                                                                                                                                                           |                                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.86                                                                                                                                                                                                                                   |                                   |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>•The lesson was conducted by a highly qualified staff member clearly and interestingly.</li> <li>•The lesson was very awesome, I learned what I wanted.</li> <li>•I especially liked the level of understanding of the topic by testing.</li> </ul> |                                   |

\* Every trainees evaluated that the explanation of the lecturer was very easy to understand.

\* It is effective for their training implementation.



|                                         |                                       |                                                                                                                                                                                                                                                               |                   |
|-----------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>10th Apr, 2018</b>                                                                                                                                                                                                                                         | <b>9:00~10:40</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Naoki Yamada / MH PS, Takasago Service Division Overseas Project Promotion Group                                                                                                                                                                          |                   |
| <b>Course (5-15)</b>                    |                                       | Periodical Maintenance                                                                                                                                                                                                                                        |                   |
| <b>Aim of Lecture</b>                   |                                       | Understanding of maintenance guidelines of MHPS Gas Turbine                                                                                                                                                                                                   |                   |
| <b>Contents of Lecture</b>              |                                       | Maintenance guideline of gas turbine                                                                                                                                                                                                                          |                   |
|                                         |                                       | Concept of operating hours.                                                                                                                                                                                                                                   |                   |
|                                         |                                       | Outline of periodic inspection                                                                                                                                                                                                                                |                   |
|                                         |                                       | Damage and repairment of hot gas path parts                                                                                                                                                                                                                   |                   |
| <b>Lecturer's self evaluation</b>       |                                       | Basically I answered the question immediately, but some times I explained too much detail.                                                                                                                                                                    |                   |
|                                         |                                       | The scheduled time was exceeded.                                                                                                                                                                                                                              |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | As they already attended some related lectures, I am sure they had a good understanding.                                                                                                                                                                      |                   |
|                                         |                                       | They were good attitude and wanted to know more and more.                                                                                                                                                                                                     |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                       |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                       |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.57                                                                                                                                                                                                                       |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                      |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                                                                                                                                                                                    |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 3.86                                                                                                                                                                                                            |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                                                                                                                                                                                         |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                                                                                  |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                              |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                      |                   |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>•It's a pity that there was not enough time for a more detailed explanation of the CPFPM system.</li> <li>•The lecture on the topic "Periodic maintenance" is prepared in accordance with the requirements.</li> </ul> |                   |

|                                         |                                       |                                                                                                                                                                                                                                                                       |                    |
|-----------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Date</b>                             |                                       | <b>10th Apr, 2018</b>                                                                                                                                                                                                                                                 | <b>10:50~11:55</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Hayato Mishizaki / MHPS Gas turbine service, Overseas department                                                                                                                                                                                                  |                    |
| <b>Course (5-15)</b>                    |                                       | Periodical Maintenance                                                                                                                                                                                                                                                |                    |
| <b>Aim of Lecture</b>                   |                                       | Expllanation of outline of periodic inspection and notes                                                                                                                                                                                                              |                    |
| <b>Contents of Lecture</b>              |                                       | Outline of periodic inspection & parts arrangement                                                                                                                                                                                                                    |                    |
|                                         |                                       | Flow of periodic inspection from planing to execution (engineering schedule)                                                                                                                                                                                          |                    |
|                                         |                                       | Tool / Foreign material control management                                                                                                                                                                                                                            |                    |
|                                         |                                       | How to set up and think of laydown plan                                                                                                                                                                                                                               |                    |
| <b>Lecturer's self evaluation</b>       |                                       | The level of trainee's understanding was higher than expected, and it was possible to complete the lecture on time.                                                                                                                                                   |                    |
|                                         |                                       | I explainted that it is important for periodic inspection that MHPS and customers cooperate closely and it is important                                                                                                                                               |                    |
| <b>Trainees' evaluation by lecturer</b> |                                       | Trainees joined this training with high interested and motivation.                                                                                                                                                                                                    |                    |
|                                         |                                       |                                                                                                                                                                                                                                                                       |                    |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                               |                    |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                                                                                                                                                                                               |                    |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.57                                                                                                                                                                                                                               |                    |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                              |                    |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                                                                                                                                                                                            |                    |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 3.86                                                                                                                                                                                                                    |                    |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                                                                                                                                                                                                 |                    |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                                                                                                                                                                                                          |                    |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                                      |                    |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                              |                    |
|                                         | <b>Trainees' comments</b>             | <ul style="list-style-type: none"> <li>•The lecturer competently and intelligibly explained the content of the material.</li> <li>•I think that the allocated time for such topics is very small and at the end of the educational process is not correct.</li> </ul> |                    |

\* Instructor evaluated that the trainees' high knowledge and motivation.

\* JET expect that they will try to prepare their training contents with periodical maintenance.

|                                         |                                       |                                                                                           |                    |
|-----------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------|--------------------|
| <b>Date</b>                             |                                       | <b>10th Apr, 2018</b>                                                                     | <b>13:00~16:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Ikuto Matsui / MHPS, Chief, Takasago Electric Design Division, Electrical Design Dept |                    |
| <b>Course (5-15)</b>                    |                                       | GT Electrical & Control Package                                                           |                    |
| <b>Aim of Lecture</b>                   |                                       | Understanding of GT control PKG and internal distribution equipment                       |                    |
| <b>Contents of Lecture</b>              |                                       | PLANT CONFIGURATION                                                                       |                    |
|                                         |                                       | ELECTRICAL SYSTEM CONFIGURATION                                                           |                    |
|                                         |                                       | SPECIFICATION OF ELECTRICAL EQUIPMENTS                                                    |                    |
|                                         |                                       | GT CONTROL PACKAGE AUXILIARIES                                                            |                    |
| <b>Lecturer's self evaluation</b>       |                                       | It seems that participants understood well the contents,                                  |                    |
|                                         |                                       | The drawings, that were used on the training, were too small and need to be improved.     |                    |
| <b>Trainees' evaluation by lecturer</b> |                                       | Some trainees have good knowledge about electrical equipment, they understood quite well. |                    |
|                                         |                                       | They asked some questions and I felt that they actively joined this training.             |                    |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 3.86                                                   |                    |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 3.86                                                   |                    |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.57                                                   |                    |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                  |                    |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 3.86                                                |                    |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 3.86                                        |                    |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                     |                    |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 3.86                              |                    |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                          |                    |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                  |                    |
|                                         | <b>Trainees' comments</b>             | •The material is dedicated to the need for repair work.                                   |                    |

\* Some participants felt that the time was short and the content was complicated.

|                                         |                                       |                                                                                                                                                                                                                                                                                                                                                        |                   |
|-----------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Date</b>                             |                                       | <b>11th Apr, 2018</b>                                                                                                                                                                                                                                                                                                                                  | <b>9:00~12:00</b> |
| <b>Lecturer Name/Affiliation</b>        |                                       | Mr. Keishi Kobayashi / MHPS, Chief engineer, Takaguchi Construction Commissioning Technology Division                                                                                                                                                                                                                                                  |                   |
| <b>Course (5-16)</b>                    |                                       | GT Commissioning Procedure                                                                                                                                                                                                                                                                                                                             |                   |
| <b>Aim of Lecture</b>                   |                                       | GT commissioning at Combined Cycle Power Plant                                                                                                                                                                                                                                                                                                         |                   |
| <b>Contents of Lecture</b>              |                                       | Commissioning Flow                                                                                                                                                                                                                                                                                                                                     |                   |
|                                         |                                       | Test operation of auxiliary equipments and test items of main equipment.                                                                                                                                                                                                                                                                               |                   |
|                                         |                                       | Action at Emergency condition                                                                                                                                                                                                                                                                                                                          |                   |
| <b>Lecturer's self evaluation</b>       |                                       | It took more time to explain than expected and I could not complete all the explanations of the text because of many questions.                                                                                                                                                                                                                        |                   |
| <b>Trainees' evaluation by lecturer</b> |                                       | Some trainees positively asked questions and I could confirm their understanding are correct.                                                                                                                                                                                                                                                          |                   |
| <b>Evaluation by trainees</b>           | <b>Contents</b>                       | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                |                   |
|                                         | <b>Amount</b>                         | Evaluation Score (7 pers. average) 4.00                                                                                                                                                                                                                                                                                                                |                   |
|                                         | <b>Time</b>                           | Evaluation Score (7 pers. average) 3.71                                                                                                                                                                                                                                                                                                                |                   |
|                                         | <b>Comprehension</b>                  | Evaluation Score (7 people average) 3.86                                                                                                                                                                                                                                                                                                               |                   |
|                                         | <b>Acquired knowledge and ability</b> | Acquired knowledge : Evaluation Score 4.00                                                                                                                                                                                                                                                                                                             |                   |
|                                         |                                       | Useful to make Action Plan Evaluation Score : 4.00                                                                                                                                                                                                                                                                                                     |                   |
|                                         |                                       | Helpful to improve your knowledge and ability : Evaluation Score 3.86                                                                                                                                                                                                                                                                                  |                   |
|                                         |                                       | Valuable lecture to become a trainer : Evaluation Score 4.00                                                                                                                                                                                                                                                                                           |                   |
|                                         |                                       | Effective for considering equipment lists: evaluation point 3.86                                                                                                                                                                                                                                                                                       |                   |
|                                         |                                       | Effective for reviewing Russian training materials. 3.71                                                                                                                                                                                                                                                                                               |                   |
|                                         | <b>Trainees' comments</b>             | •The lecture on the topic "The procedure for commissioning GT" covered the full scope of the issues of the schedule and methods of repairing the gas turbine. The lecturer answered all the questions raised by the listeners. The rich experience of repair and adjustment works of the teacher served as an intelligible explanation of the material |                   |

\* Evaluation of lecture contents was high, but some trainees felt that it was difficult.

(1) Closing Ceremony for 3<sup>rd</sup> TOT

The trainees made a presentation about the achievements of this TOT and future implementation of this project. We had Q&A session and comments from the Japanese side, awarded a certificate of completion, and closed the training in Japan.

Date & Venue

Date; 12th Apr., 2018 : AM 10~P.M.

Venue : JICA Tokyo Room No. SR409

Main participant: 7 Trainees/ Trainer Candidates of Navoi New Training Center

**Agenda for Closing Ceremony for 3<sup>rd</sup> TOT in Japan**

| Date  | DayWK    | Time  |                                                  | Event | Venue                                                                               | Facilitated by                  |                             |                                            |                                                          |
|-------|----------|-------|--------------------------------------------------|-------|-------------------------------------------------------------------------------------|---------------------------------|-----------------------------|--------------------------------------------|----------------------------------------------------------|
| 4/12  | Thursday | 10:00 | ～                                                | 10:10 | Opening / Self -introduction                                                        | JICA Tokyo<br><br>Room<br>SR409 | JET/AEC                     | Mr. Saito/ Facilitator                     |                                                          |
|       |          |       |                                                  |       | Opening Remarks                                                                     |                                 | JET/AEC                     | Mr. Murata/ JET Leader                     |                                                          |
|       |          | 10:13 | ～                                                | 11:40 | Presentation "Training result and future" by representative of trainee Mr. Eshev H. |                                 | Trainee/ Trainer Candidates | 7 participants of 3rd training in Japan    |                                                          |
|       |          |       |                                                  |       | 30 minutes for presentation & 10-20 minutes for Q&A                                 |                                 | Training manager            | Mr. Katori/ Translation                    |                                                          |
|       |          |       |                                                  |       |                                                                                     |                                 | AEC                         | Mr Umid/ Presentation Advisor              |                                                          |
|       |          |       |                                                  |       |                                                                                     |                                 |                             |                                            |                                                          |
|       |          | 11:40 | ～                                                | 11:53 | Awarding Certificate                                                                |                                 |                             | JICA                                       | Mr. Yuzurio/ Director of Energy and Mining Group, Team 1 |
|       |          | 11:53 | ～                                                | 11:55 | Impression & Greeting                                                               |                                 |                             | Representative of Trainee Mr. Istam Toshov |                                                          |
|       |          | 11:55 | ～                                                | 12:00 | Closing remarks                                                                     |                                 |                             | JICA                                       | Mr. Yuzurio/ Director of Energy and Mining Group, Team 1 |
|       |          | 12:00 | ～                                                | 12:10 | Photo session                                                                       |                                 |                             | All Attendance                             |                                                          |
| 12:10 | ～        |       | After Celemony; Lunch, preparation for departure |       |                                                                                     |                                 |                             |                                            |                                                          |

1) Participant's self-introduction

2) Opening Remarks from Mr. Murata / JET Leader

In the greetings, he emphasized the following points.

- Trainer candidates should aim at the highest level of comprehension of textbooks by question and discussion. If you have any questions, please actively ask to Japanese experts.
- Proposal for development of technical term glossary in Russian

3) Presentation “Training Result and Future”

They made presentations on the achievements of the training in Japan, the person in charge of 12 courses and the lesson plans. (Refer to the attachment-1.)

## 5. Comments and evaluation of 3<sup>rd</sup> TOT in Japan by trainees

From the questionnaire after the completion of the training, the comments from trainees are summarized below.

### (1) Comments and Suggestions

“I was able to learn what I wanted to know.”

“I was able to understand the essence of this project.”

“Everything was very beneficial and I was able to achieve my goal.”

### (2) Training Course

#### 1) Beneficial

- (a) Gas turbine control system (7 persons)
- (b) Vibration basic technology (6 persons)
- (c) PCM Method (5 persons)
- (d) Outline of C&I system (4 persons)
- (e) Operating principle of air-cooled condenser (3 persons)
- (f) Factory site-tour (3 persons)
- (g) Composition of gas turbine auxiliaries (3 persons)
- (h) All (2 persons)

#### 2) Not necessary

Most of trainees stated that there was no courses that they felt not necessary. Regarding "Washing machine of gas turbine wing", there was an opinion that this type of machine is not used, so it is not necessary.

#### 3) Required more

- (a) Protection of gas turbine (2 persons)
- (b) Details of gas turbine C&I
- (c) Static frequency converter
- (d) Overview of metal and steel
- (e) Cleaning of metal with chemical substances
- (f) Inception of CPM
- (g) Cleaning and repairing of heat exchanger

#### 4) Recommendations to the training design

The results of questionnaire shows the high level of satisfaction in the quality of the training. And, there were many comments that this experience will be useful for their own work.

- (a) Training Period : Short time for factory and site-tour
- (b) Accommodation : To change the hotel in Yanai

5) Learnings from 3<sup>rd</sup> TOT in Japan

- (a) Training classroom with equipment and teaching materials prepared
- (b) Detailed planning of schedule and presentation materials
- (c) Presence of a high level instructor

6) Impression of Japan and Japanese people

- (a) Accurate in the time, keep discipline
- (b) Politeness
- (c) Kindness
- (d) Wonderfulness of culture and history
- (e) Natural riches

## **6. Summary**

(1) Aggressiveness of trainees

Throughout the training in this program, many lecturers evaluated the aggressiveness of the trainees. In addition, it was seen that the trainees tried to deepen mutual understanding.

(2) Continuance of the Project

From the comments of the questionnaire, there were several opinions that wished to continue this Project.

(3) On-Site Training utilizing periodical inspection

“On-site training by UE, utilizing periodic inspection of combined cycle” is hard to implement, caused by scheduling problem during this project. JICA Expert Team finally decided to cultivate trainer candidate with experiencing “Periodical Inspection”, with the course contents of TOT in Japan, instead of in Uzbekistan.

(4) Summary on implementation results of the 1st - 3rd TOT in Japan

Regarding the implementation of this project as a whole, we will report the summary as attachment-2. It includes the results of 1<sup>st</sup> and 2<sup>nd</sup> TOT in Japan and implementation status of TOT in Uzbekistan of this project.

## **7. Acknowledgments**

We, all the members of this project, gratefully thanks to Ms. Masuya from JICA HQ, Ms. Kimura and Ms. Nakasone from JICA Chugoku Center, JICA Coordinator Mr. Katori and Ms. Tanaka, lecturers from IC-NET, PET and MHPS.



UzbekEnergo



# *REPORT*

*about the results of the  
work done on the training  
center of JSC “NAVOI TPP”*





# *Briefly about the state of the Uzbek energy system*

At present, 7 thermal power plants are in operation in the Uzbek power system. The installed capacity of the generating facilities excluding the newly introduced CCGTs is 12,400 MW



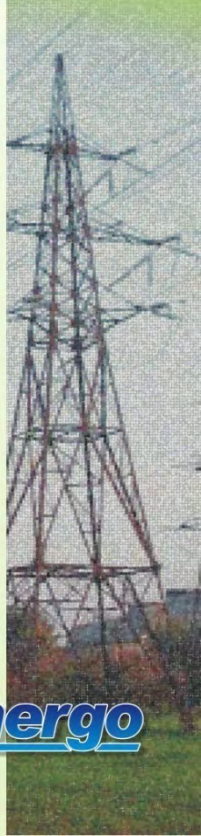


In order to use the economic feasibility of power generating facilities, the Government of the Republic approved projects for the implementation of combined-cycle power plants on the basis of existing stations and also in new regions of the Republic. Until 2023, it is planned to build 20 CCGT units with a total capacity of more than 6270 MW throughout the country.



Based on the experience of the 3rd training in Japan, together with the future plan of action, the following points were summarized.

- The final decision of the persons responsible for 12 courses and future plans
- About the creation and review of the Lesson Plan
- Results of consideration of trainer-candidates and the head for training centre regarding the position of each course and preparation of the training plan



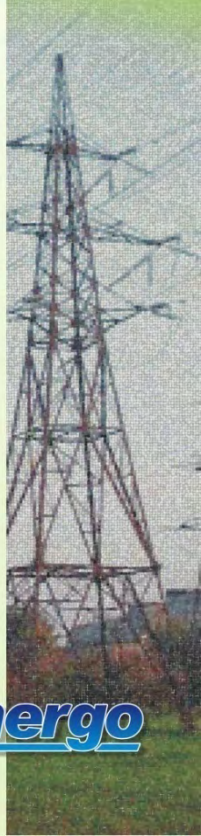


# Approved instructors for the training center of JSC NTPP

| №  | Name                 | Position                                               | Teaching filed |
|----|----------------------|--------------------------------------------------------|----------------|
| 1  | Musaev Alisher       | Leading engineer on TME (thermal mechanical equipment) | Mechanical     |
| 2  | Aslonov Aslon        | Shift head                                             | Mechanical     |
| 3  | Djamalov Bakhodir    | Repair master of TME                                   | Mechanical     |
| 4  | Bayliev Shukhrat     | GT Operator                                            | Mechanical     |
| 5  | Islamov Ismail       | Repair master of TME                                   | Mechanical     |
| 6  | Bazarov Fakhridin    | BOP Operator                                           | Mechanical     |
| 7  | Pirnazarov Nurali    | Senior patrol operator of Unit                         | Mechanical     |
| 8  | Khudoykulov Lutfullo | GT Operator                                            | Mechanical     |
| 9  | Khasanov Latif       | Leading engineer programmer                            | Programming    |
| 10 | Toshov Istam         | Leading C&I Engineer                                   | C&I            |
| 11 | Narziev Akmal        | C&I engineer                                           | C&I            |
| 12 | Toshov Sanjar        | Electrical technical labo master                       | Electrical     |
| 13 | Parmonov Azim        | Leading electrical engineer                            | Electrical     |
| 14 | Eshev Khamdam        | Leading electrical engineer                            | Electrical     |
| 15 | Makhmudov Aziz       | Metal labo worker                                      | Mechanical     |



- Our colleagues in the second TOT in Japan drafted an action plan for the textbooks of the training center.
- At the moment, textbooks No. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 have already been finalized. Corrected translation errors in terms of technical content.
- Lesson plans with milestones have been drawn up.





## Формат План действий

[illegible]

«УТВЕРЖДАЮ»

Директор учебного центра

Достов Ш.О.

1. Номер и название учебного курса

4. Оборудование комбинированной генерации газовой турбины

Ответственный инструктор для данного курса

Главный:

Заместитель:

Другие:

2. Стандартное количество слушателей

10 слушателей.

Целевые слушатели

Работники АО «НТЭС»

3. Продолжительность курса (часы)

3 дня (21 час)

4. Содержание курса и часы

| № | Главы                                               | дни    | часы |
|---|-----------------------------------------------------|--------|------|
| 1 | Обзор Навоийской ТЭС                                | первый | 3    |
| 2 | Основы комбинированного цикла выработки             | первый | 4    |
| 3 | Основные знания о ГТ                                | второй | 3    |
| 4 | Периодическая инспекция и инспекция камеры сгорания | второй | 4    |
| 5 | Котел утилизатор                                    | третий | 2    |
| 6 | Паровая турбина                                     | третий | 2    |
| 7 | Примеры неисправностей                              | третий | 2    |
| 8 | Анкетирование                                       | третий | 1    |

5. Необходимое оборудование для данного курса

Не требуется

6. Контрольные точки данного курса

| № | Контрольные точки в деталях                               |
|---|-----------------------------------------------------------|
| 1 | Контрольные вопросы после прохождения каждой главы        |
| 2 | Тестирования после прохождения данного учебника           |
| 3 | Короткометражные видеоролики с «You Tube» по оборудованию |
| 4 | Экскурсия по узлам основных оборудованиях                 |
| 5 |                                                           |

7. Вопросы и типичные ответы для заключительного экзамена курса

8. Критерии оценки слушателей

| № | Параметры                         | Результат |
|---|-----------------------------------|-----------|
| 1 | Уровень посещаемости тренинга (%) |           |
| 2 | Количество заданных вопросов      |           |
| 3 | Понимание лекции                  |           |

**- The main instructor and his deputy will be included in the lesson plan in the following table**

**- During the training period, we plan to include video clips on the technological process from Youtube in order to make the lesson understandable and interesting.**

**- ALL LESSON PLANS**



**UzbekEnergo**



| No | Course name                                          | Main instructor | Deputy                                   |
|----|------------------------------------------------------|-----------------|------------------------------------------|
| 1  | Nondestructive testing                               | Makhmudov A.    | Djamalov B., Islamov I.                  |
| 2  | Vibration analysis for rotating machine              | Islamov I.      | Toshov I., Djamalov B.                   |
| 3  | Remaining life assessment                            | Aslonov A.      | Djamalov B. Makhmudov A.                 |
| 4  | Gas Turbine (GT) Combined Power Generation Equipment | Musaev A.       | Aslonov A., Khudoykulov L.               |
| 5  | GT Hot Parts Maintenance                             | Djamalov B.     | Islamov I., Bayliev Sh.                  |
| 6  | Details of Electrical Facilities for GT CCPP         | Toshov S.       | Eshev Kh., Parmonov A.                   |
| 7  | Operation & Control Theory of GT CCPP                | Toshov I.       | Parmonov A., Khasanov L., Khudoykulov L. |
| 8  | Details of Control & Instrument Devices for GT CCPP  | Narziev A.      | Toshov I., Khasanov L.                   |
| 9  | GT Operation & Maintenance                           | Bazarov F.      | Khudoykulov L., Aslonov A                |
| 10 | GT Control System                                    | Pirnazarov N.   | Bayliev Sh., Musaev A.                   |
| 11 | GT Electrical Control System                         | Parmonov A.     | Eshev Kh., Bazarov F., Pirnazarov N.     |
| 12 | GT O&M lecture                                       | Musaev A.       | Khudoykulov L., Islamov I.               |



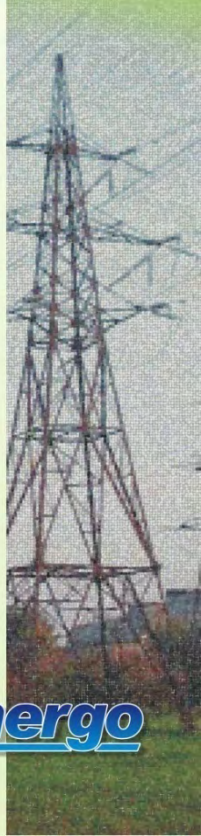


- In order to fully implement and effectively complete the project, we consider it expedient to include in the training material an additional thirteenth textbook with the content of the following topics:
- studying of SFC logic circuits and electric protection of generators (GT Gen, ST Gen).
- diagnostics of fluctuation sensors;
- maintenance of software of the "DIASYS Netmation" system





- We would like to note that all the project activities carried out by Japanese experts and instructor candidates are conducted in sufficient measure according to the schedule. In this regard, we want to sincerely thank our respected Sensei and JICA for their hard work.
- Due to certain reasons, there are minor delays in completing the repair of the building of our training center.
- During the project implementation, a partial supply of training equipment for classrooms was made. But unfortunately, the repair of the building of the training center has not been completed so far. Therefore, we can begin to train new employees for Navoi CCGT-2 unit and Turakurgan CCPP-1 and 2 only after the completion of the renovation of the building.
- And the completion of our project is planned in March 2019.
- Unfortunately, until the end of project, we will have very few opportunity to conduct actual training of staff in theory and practice using training equipment. Accordingly, we would like to ask the JICA management to extend the duration of our project by several years, since this training center is of paramount importance for the new energy infrastructure of Uzbekistan. We sincerely hope that JICA will positively satisfy our request and will provide long-term assistance in the development of our training center.
- 







- And also we really liked the level of specialists of power plants Chugoku Electric and the plant MHPS achieved thanks to personnel rotation between sections and organizations.
- If JICA approved our proposal to extend our Project for another 3 years, then I have a good idea that would contribute to a general increase in the operation and maintenance potential of all Uzbekenergo power plants.
- In the future, at our training center with the help of Japanese experts, we would organize joint seminars and conferences to improve the capacity of the O & M of the CCPP by inviting specialists of all levels from all CCPP units of Uzbekenergo. These periodic meetings at different levels would help us learn about the specific problems of the CCPP, about frequent breakdowns, or about concrete achievements in O & M of individual units, or about new world achievements in the field of CCPP. This would help collectively analyze the specific problems of O & M CCP.
- Although all TPPs are located under Uzbekenergo, they all have separate business entities and employees.
- And my proposal would help the overall development of O & M potential and close communication between power plants.
- To implement this idea, we need the support of our experienced Japanese experts.





## Our gratitudes



*The Project* for  
Establishment of the Combined Cycle Gas Turbine (CCGT)  
Operation and Maintenance Training Center in Uzbekistan

# *Technical Transfer of The Project*

*JICA Expert Team of The Project*

Asia Engineering Consultant Co., Ltd.

Nippon Koei Co., Ltd.

The Chugoku Electric Power Co., Inc.

Power Engineering and Training Services, Inc.



# Overview

## Contents

- ▶ Training course/ subject (12 courses) and Textbook
- ▶ Review and revision of textbook
- ▶ Training of Trainer (TOT)
- ▶ Training equipment and practical training
- ▶ PCM Training @ Training in Japan
- ▶ Lecture Plan/Lesson Plan by Trainer - Navoi Training Center
- ▶ On-Site Training @ Training in Japan
- ▶ Mock-UP training/ Simulation of "lecture & practical" training

## Location of Cultivation of TOT @

Training in Japan 1st, 2nd and 3rd

TOT in Uzbekistan, in Mission to Uzbekistan

# *Training Course/Subject and Textbook*

# Proposal of subjects

- 12 target subjects/ courses were discussed and agreed
- Proposed in 1st JCC in Uzbekistan and discussed

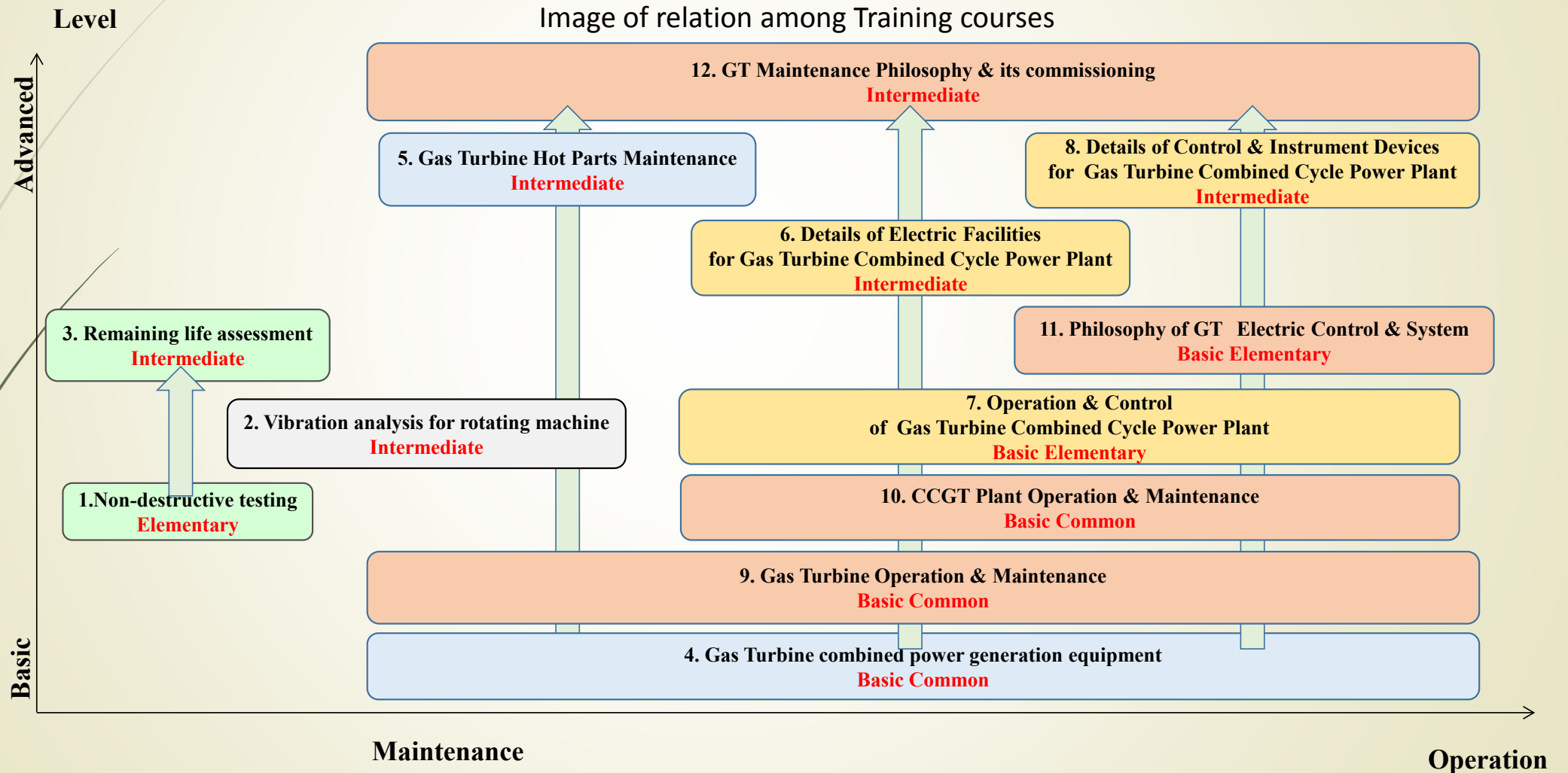
Training Course/ Subject, and preferable condition

| Text No. / Course Title |                                                                                            | Training Level of course | Target field of trainee |                         | Potential of on-site training for <u>upper class</u> | Standard Training Days | Standard Trainees Number | Procured Training Equipment by JICA | Required Number of Trainer for the course/ subject |                |                   |
|-------------------------|--------------------------------------------------------------------------------------------|--------------------------|-------------------------|-------------------------|------------------------------------------------------|------------------------|--------------------------|-------------------------------------|----------------------------------------------------|----------------|-------------------|
|                         |                                                                                            |                          |                         |                         |                                                      |                        |                          |                                     | Chief Trainer                                      | Deputy Trainer | Assistant Trainer |
| Mechanical Field        |                                                                                            |                          |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 1                       | Non-destructive testing                                                                    | Elementary               | Mechanist               | Maintenance             | —                                                    | 2                      | 10                       | ○                                   | 1                                                  | 1              | 1                 |
| 2                       | Vibration analysis for rotating machine                                                    | Intermediate             | Mechanist               | Maintenance             | —                                                    | 3                      | 10                       | ○                                   | 1                                                  | 1              | 1                 |
| 3                       | Remaining life assessment                                                                  | Intermediate             | Mechanist               | Maintenance             | —                                                    | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 4                       | Gas Turbine;<br>Combined power generation equipment                                        | Basic Common             | All Staff of CCPP       | Maintenance & Operation | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 5                       | Gas Turbine;<br>Hot Parts Maintenance                                                      | Intermediate             | Mechanist               | Maintenance             | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| Electrical Field        |                                                                                            |                          |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 6                       | Details of Electrical Facilities for Gas Turbine Combined Cycle Power Plant                | Intermediate             | Electrician             | Maintenance             | —                                                    | 4                      | 8                        | ○                                   | 1                                                  | 1              | 1                 |
| 7                       | Operation & Control Theory of Gas Turbine Combined Cycle Power Plant                       | Basic Elementary         | Electrician & Mechanist | Maintenance & Operation | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 8                       | Details of Control & Instrument Devices for Gas Turbine Combined Cycle Power Plant         | Intermediate             | Electrician C&I         | Maintenance             | effective                                            | 5                      | 8                        | ○                                   | 1                                                  | 1              | 1                 |
| Equipment Field         |                                                                                            |                          |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 9                       | Basic Gast Turbine<br>Gas Turbine Operation & Maintenance                                  | Basic Common             | All Staff of CCPP       | Maintenance & Operation | effective                                            | 3                      | 15                       | ○                                   | 1                                                  | 1              | —                 |
| 10                      | CCGT Plant Operation & Maintenance<br>Gas Turbine Control System                           | Basic Common             | Electrician & Mechanist | Maintenance & Operation | effective                                            | 3                      | 15                       | —                                   | 1                                                  | 1              | —                 |
| 11                      | Philosophy of GT electrical system and GT control<br>Gas Turbine Electrical Control System | Basic Elementary         | Electrician             | Maintenance & Operation | effective                                            | 1                      | 15                       | —                                   | 1                                                  | 1              | —                 |
| 12                      | Gas Turbine Maintence Pholsophy and its commissioning<br>Gas Turbine O&M Lecture           | Intermediate             | Electrician & Mechanist | Maintenance & Operation | —                                                    | 1                      | 15                       | —                                   | 1                                                  | 1              | —                 |

- Chief Trainer should manage and implement the Training Course. Deputy Trainer should be alternative for Chief trainer.
- Assistant Trainer will be apprentice, and can participate the training including practical training as an assistant under guidance of other trainer.
- upper class* including Manager, Engineer, Trainer Candidate and etc.
- All condition of the course should be arranged by Chief Trainer to be optimized for target trainees.



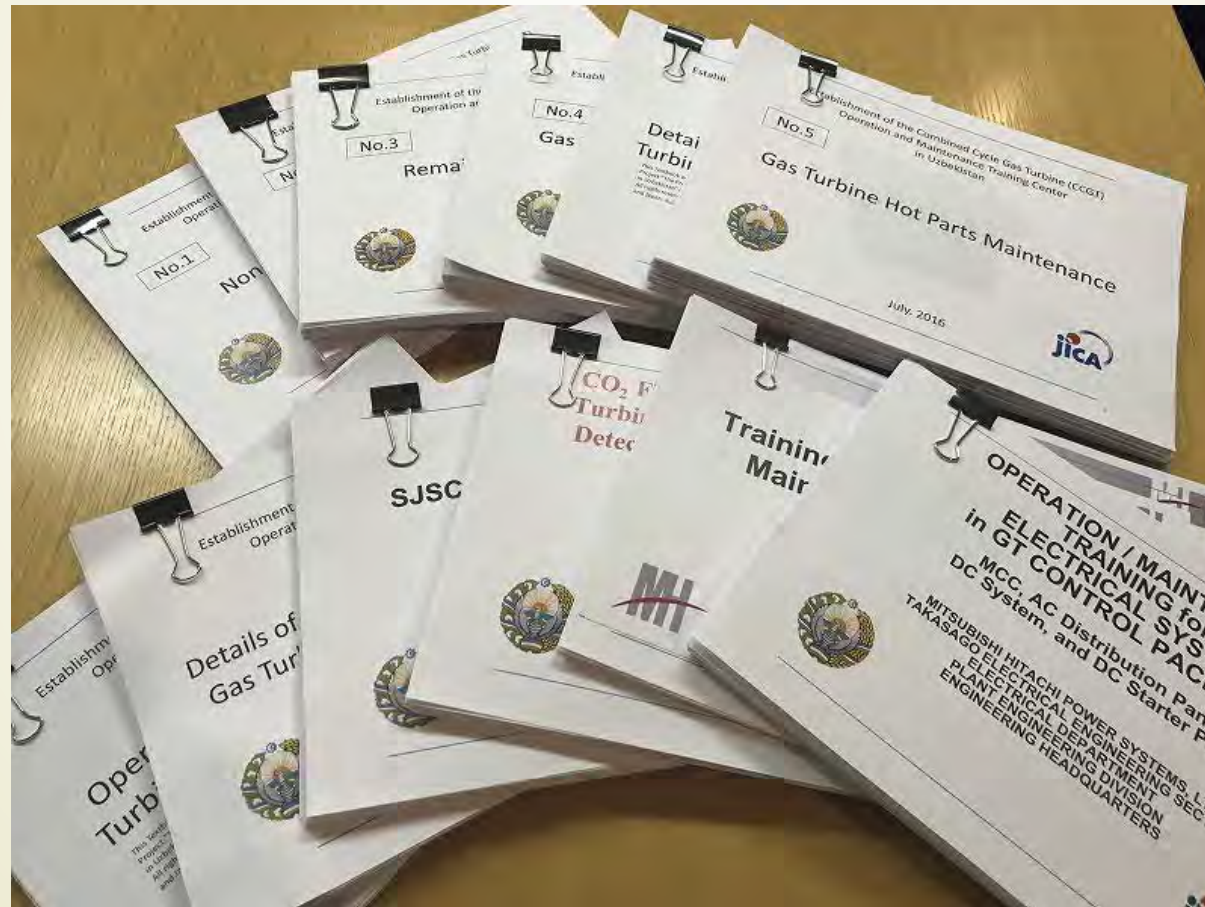
# Relation among subjects



# *Review and revision of Textbook*

# *Proposed Textbook*

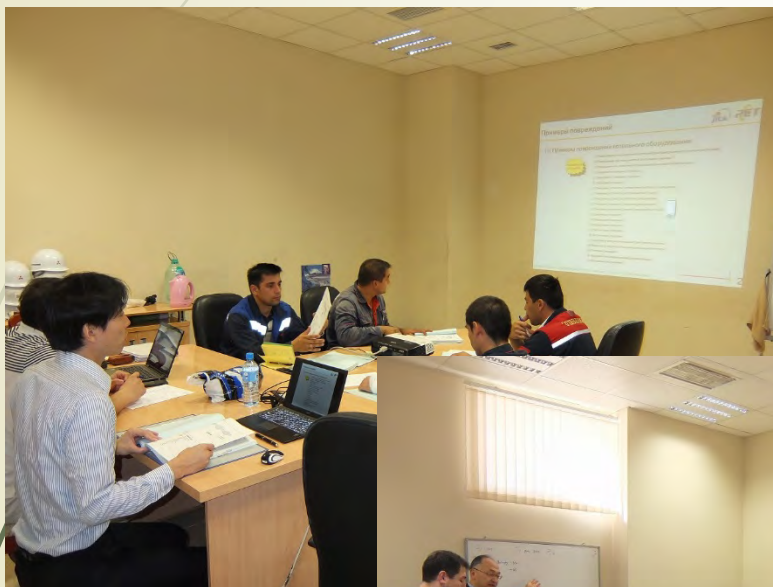
- Original contents in English were proposed, and handover from JET.





# *Review of Textbook*

- ▶ Original contents were translated to Russian, and reviewed in TOT UZ by Trainer Candidates.





# Revised Russian Textbook

- Textbooks were revised, and will finally be printing as a Textbook of NTC.



# *Training of Trainer*



# Training in Japan

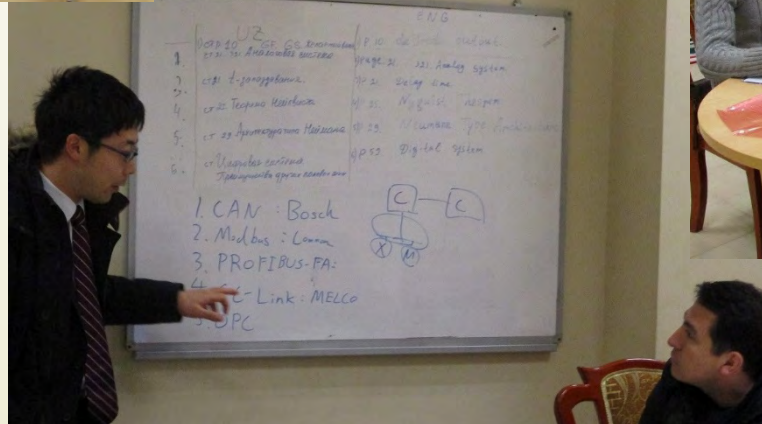








# TOT in Uzbekistan



# *Training Equipment and Practical Training*

# Training Equipment

- Training Equipment were procured by JICA for 5 courses/subjects.

| Training Course/ Subject, and preferable condition |                                                                                         |                         |                         |                         |                                                      |                        |                          | by JET                              |                                                    |                |                   |
|----------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|------------------------------------------------------|------------------------|--------------------------|-------------------------------------|----------------------------------------------------|----------------|-------------------|
| Text No. / Course Title                            | Training Level of course                                                                | Target field of trainee |                         |                         | Potential of on-site training for <u>upper class</u> | Standard Training Days | Standard Trainees Number | Procured Training Equipment by JICA | Required Number of Trainer for the course/ subject |                |                   |
|                                                    |                                                                                         |                         |                         |                         |                                                      |                        |                          |                                     | Chief Trainer                                      | Deputy Trainer | Assistant Trainer |
| Mechanical Field                                   |                                                                                         |                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 1                                                  | Non-destructive testing                                                                 | Elementary              | Mechanist               | Maintenance             | —                                                    | 2                      | 10                       | ○                                   | 1                                                  | 1              | 1                 |
| 2                                                  | Vibration analysis for rotating machine                                                 | Intermediate            | Mechanist               | Maintenance             | —                                                    | 3                      | 10                       | ○                                   | 1                                                  | 1              | 1                 |
| 3                                                  | Remaining life assessment                                                               | Intermediate            | Mechanist               | Maintenance             | —                                                    | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 4                                                  | Gas Turbine; Combined power generation equipment                                        | Basic Common            | All Staff of CCPP       | Maintenance & Operation | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 5                                                  | Gas Turbine; Hot Parts Maintenance                                                      | Intermediate            | Mechanist               | Maintenance             | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| Electrical Field                                   |                                                                                         |                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 6                                                  | Details of Electrical Facilities for Gas Turbine Combined Cycle Power Plant             | Intermediate            | Electrician             | Maintenance             | —                                                    | 4                      | 8                        | ○                                   | 1                                                  | 1              | 1                 |
| 7                                                  | Operation & Control Theory of Gas Turbine Combined Cycle Power Plant                    | Basic Elementary        | Electrician & Mechanist | Maintenance & Operation | effective                                            | 3                      | 10                       | —                                   | 1                                                  | 1              | —                 |
| 8                                                  | Details of Control & Instrument Devices for Gas Turbine Combined Cycle Power Plant      | Intermediate            | Electrician C&I         | Maintenance             | effective                                            | 5                      | 8                        | ○                                   | 1                                                  | 1              | 1                 |
| Equipment Field                                    |                                                                                         |                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |
| 9                                                  | Basic Gast Turbine Gas Turbine Operation & Maintenance                                  | Basic Common            | All Staff of CCPP       | Maintenance & Operation | effective                                            | 3                      | 15                       | ○                                   | 1                                                  | 1              | —                 |
| 10                                                 | CCGT Plant Operation & Maintenance Gas Turbine Control System                           | Basic Common            | Electrician & Mechanist | Maintenance & Operation | effective                                            | 3                      | 15                       | —                                   | 1                                                  | 1              | —                 |
| 11                                                 | Philosophy of GT electrical system and GT control Gas Turbine Electrical Control System | Basic Elementary        | Electrician             | Maintenance & Operation | effective                                            | 1                      | 15                       | —                                   | 1                                                  | 1              | —                 |
| 12                                                 | Gas Turbine Maintence Pholsophy and its commissioning Gas Turbine O&M Lecture           | Intermediate            | Electrician & Mechanist | Maintenance & Operation | —                                                    | 1                      | 15                       | —                                   | 1                                                  | 1              | —                 |

- The project team could not implement before delivery of equipment. So, JET implemented alternative practical course in Training in Japan.
- Implemented course were No.1 "Non-destructive testing" in 2nd Training in Japan, and course No2 "Vibration analysis for rotating machine" in 3rd Training in Japan.
- For the course No.6 and No.8, there were no occasion to implement practical training in Japan, Practical training will be implemented in Uzbekistan after equipment delivery.



# Practical Training No1

- ▶ Practical Training was implemented for course No. 1

“Non- destructive testing” @ *Training in Japan*

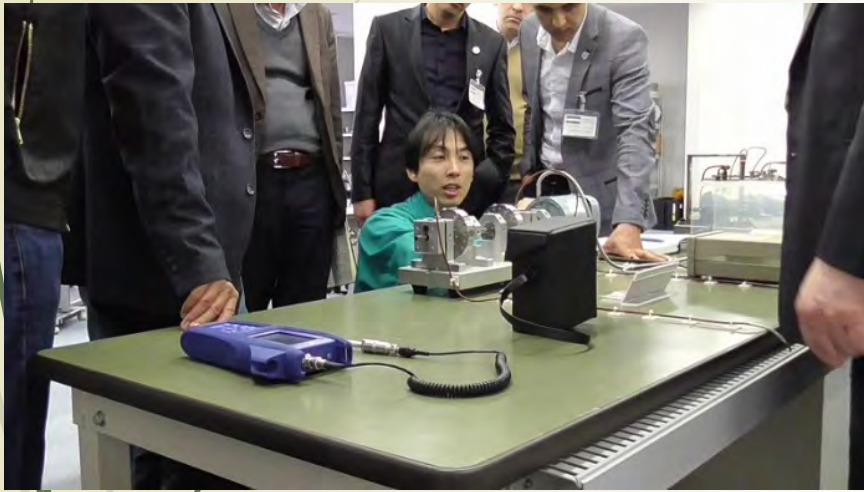




# *Practical Training No2*

- ▶ Practical Training was implemented for course No. 2

“Vibration analysis for rotating machine” @ *Training in Japan*



# *Practical Training No2*

- ▶ Practical Training was implemented for course No. 2

“Vibration analysis for rotating machine” @ *Training in Japan*





# *Practical Training No2*

- ▶ Practical Training was implemented for course No. 2

“Vibration analysis for rotating machine” @ *Training in Japan*



# *Practical Training* *coming up soon*

- Remaining practical training for following courses will be coming up soon.
- For course No. 2 “Vibration analysis for rotating machine” on TOT in UZ @13th mission (scheduled on Oct. 2018)
- For course No.8 “Detail of C&I devices/ C&I Control box” on TOT in UZ @12th Mission (scheduled on end of Jul. 2018)
- For course No.6 “Detail of Electrical Facilities/ SFC” on TOT in UZ @Xth Mission (schedule not decided)



*IPCM Training*  
*@Training in Japan*

# PCM Training



3-й этап работы над проектом: подготовка и ведение переговоров с заказчиком по системе

| Activity                                                 | Sub-activity                                             | Products                                                 | Implementing personnel | Duration | APR | May | June | July | Aug |
|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|------------------------|----------|-----|-----|------|------|-----|
| Подготовка и ведение переговоров с заказчиком по системе | Создание и согласование структуры системы                | Согласованная структура системы                          | JICA                   | 30 days  |     |     |      |      |     |
|                                                          | Участие в разработке и согласовании структуры системы    | Участие в разработке и согласовании структуры системы    | SI, OR and instructors | 3 days   |     |     |      |      |     |
|                                                          | Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | RAKUE PD               | 2 Weeks  |     |     |      |      |     |
|                                                          | Участие в разработке и согласовании структуры системы    | Участие в разработке и согласовании структуры системы    | JET instructors        | 1 day    |     |     |      |      |     |
|                                                          | Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | JET                    | 2 Weeks  |     |     |      |      |     |
|                                                          | Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | Uncofirmed             | 2 months |     |     |      |      |     |
| Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | Uncofirmed             | 2 Weeks  |     |     |      |      |     |
|                                                          | Подготовка и ведение переговоров с заказчиком по системе | Подготовка и ведение переговоров с заказчиком по системе | JICA                   | 3 days   |     |     |      |      |     |

# *PCM Training Process*

- ▶ JET implemented PCM method training in “Training in Japan”.
- ▶ Participant from Uzbekenergo, i.e. trainer candidates, invited to “Training in Japan”, were learned PCM method and create Action Plan for their task of the Project.
- ▶ Action Plan, concluded in “1st Training in Japan”, was including trainer's allocation of training course, reviewing the equipment list, reviewing the proposed textbook, and etc.
- ▶ Trainer candidates implemented their task according to these Action Plan. Unfortunately, all of trainer candidate were decided to replace over, due to the influence from changing construction site for training center by UE.
- ▶ Created Action Plan were becoming property to take over to new Trainer candidates.
- ▶ These action plan were implemented by new Trainer candidates, in an optimal way that can be achieved.



- To create Lecture Plan*

[illegible]

| 活動                                                       | 実施者                                                                                       | 成果          |    | 1 |   |   |   | 2 |   |   |   | 3 |   |   |   | 4 |   |   |   | 5 |   |   |   | 6 |   |   |   | 7 |   |   |   | 8 |   |   |   | 9 |   |   |   |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                                                          |                                                                                           |             |    | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <b>大学・専門学校への広報活動</b>                                     |                                                                                           |             |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 発電所管理者から許可を得る                                            | Eshov Kh. , *Musaev A                                                                     | 発電所の許可      | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 大学と専門学校の管理者の同意を得る                                        | *Eshov Kh, Musaev A                                                                       | 大学・専門学校の許可  | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| プレゼンテーション資料の作成                                           | *Aslonov A, Musaev A, *Parmonov A, Narziev A, Khasanov, Djamalov B                        | プレゼンテーション資料 | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| プレゼンテーションの実施                                             | *Aslonov A, *Parmonov A                                                                   | 参加者名簿       | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 学生を招待してGTCCについて知ってもらう(説明会)                               | *Musaev A, Khasanov L, *Parmonov A                                                        | 希望者名簿       | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 学生向けGTCC説明会について参加者にアンケートをとる                              | *Aslonov A, Parmonov A                                                                    | アンケート集計結果   | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             | 実施 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <b>発電所への就職に興味を示す学生を対象に、発電所の研修センターでGTCCに関する短期研修を実施する。</b> |                                                                                           |             |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 研修プログラムの作成                                               | Aslonov A, *Musaev A, Parmonov A, Narziev A, Khasanov L, Djamalov B, Toshov S, Bayliev Sh | 研修プログラム     | 計画 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                          |                                                                                           |             |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

# *Implementation of Action Plan*

- ▶ Action Plan for “problem to solve” is the issue under the control by manager. So that, it needs understanding of manager to implement this Action Plan directly by Trainer candidate. Trainer candidate entrusted this issue to manager in charge.
- ▶ For “to create Lecture Plan”, Trainer candidates, participated 2nd Training in Japan, continue to execute Action Plan with amendment.
- ▶ Trainer candidates, who participated 3rd Training in Japan, followed up these Action Plan. Then finally, they completed to create tentative Lecture Plan till May 2018, except course No2.

# *Lecture Plan* *Lesson Plan*

# Trainer in charge

- Trainers, in charge of each courses/subjects, were proposed by NTC, on 3rd Training in Japan
- Chief Trainer is responsible to create Lecture Plan with Deputy Trainer.

| №  | Name                 | Position                       | Training Subject / Course Number |   |   |   |   |   |   |   |   |    |    |    |
|----|----------------------|--------------------------------|----------------------------------|---|---|---|---|---|---|---|---|----|----|----|
|    |                      |                                | 1                                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1  | Musaev Alisher       | Leading Engineer TME           |                                  |   |   | ◎ |   |   |   |   |   | ○  |    | ◎  |
| 2  | Aslonov Aslon        | Shift Head                     |                                  |   | ◎ | ○ |   |   |   |   | ○ |    |    |    |
| 3  | Djamalov Bakhodir    | Maintenance Master TME         | ○                                | ○ | ○ |   | ◎ |   |   |   |   |    |    |    |
| 4  | Bayliev Shukhrat     | Operator GT                    |                                  |   |   |   | ○ |   |   |   |   | ○  |    |    |
| 5  | Islamov Ismail       | Maintenance Master TME         | ○                                | ◎ |   |   | ○ |   |   |   |   |    |    | ○  |
| 6  | Bazarov Faxriddin    | Operator BOP                   |                                  |   |   |   |   |   |   |   | ◎ |    | ○  |    |
| 7  | Pirnazarov Nurali    | Senior Engineer Power Unit     |                                  |   |   |   |   |   |   |   |   | ◎  | ○  |    |
| 8  | Khudoykulov Lutfillo | Operator GT                    |                                  |   |   | ○ |   |   | ○ |   | ○ |    |    | ○  |
| 9  | Khasanov Latif       | Leading Engineer Programmer    |                                  |   |   |   |   |   | ○ | ○ |   |    |    |    |
| 10 | Toshov Istam         | Leading Engineer C&I           |                                  | ○ |   |   |   |   | ◎ | ○ |   |    |    |    |
| 11 | Narziev Akmal        | Engineer Electrical            |                                  |   |   |   |   |   |   | ◎ |   |    |    |    |
| 12 | Toshov Sanjar        | Master Electro Technical Lab.  |                                  |   |   |   |   | ◎ |   |   |   |    |    |    |
| 13 | Parmonov Azim        | Leading Engineer Electrical    |                                  |   |   |   |   | ○ | ○ |   |   |    | ◎  |    |
| 14 | Eshev Khamdam        | Leading Engineer Electrical    |                                  |   |   |   |   | ○ |   |   |   |    | ○  |    |
| 15 | Makhumudov Aziz      | Laboratory assistant Metal-Lab | ◎                                |   | ○ |   |   |   |   |   |   |    |    |    |

◎ Chief Trainer,  
○ Deputy Trainer



# Prepared Lecture Plan

- Draft of Lecture Plan for the course No.4/ example is as follows.

План урока

Дата: «...» 2018г.  
Учебный центр по эксплуатации и техобслуживанию ПГУ  
«УТВЕРЖДАЮ»  
Директор учебного центра  
Достов Ш.О.

1. Номер и название учебного курса/ *Title & Trainer*  
4. Оборудование комбинированной генерации газовой турбины  
(GT, combined power generation equipment)  
Ответственный инструктор для данного курса/Responsible Instructor for this course  
Главный: Худойкулов Лутфулло Chief: Khudoykulov Lutfullo  
Заместитель: Муслиев Ахшиер Deputy: Musliyev Akhsier  
Другие: Байлиев Шухрат Others: Bayliyev Shukhrat

2. Стандартное количество слушателей/ Number of trainees  
10 слушателей. 10 Trainees  
Целевые слушатели: Работники АО «НТЭС»  
Персонал эксплуатации и технического обслуживания, Новые сотрудники ПГУ  
Q&M Staff of Navoi TPP, New employees for CSPP

3. Продолжительность курса (часы)/ Course duration  
На дневного месяца, год, до дневного месяца, года  
3 дня (21 час)

4. Содержание курса и часы/ Course contents and hours

| № | Главы                                              | дни    | часы |
|---|----------------------------------------------------|--------|------|
| 1 | Обзор Навоийской ТЭС                               | первый | 3    |
| 2 | Основы комбинированного цикла выработки            | первый | 4    |
| 3 | Основные знания о ГТ                               | второй | 3    |
| 4 | Периодически инспекция и инспекция камеры сгорания | второй | 4    |
| 5 | Котел утилизатор                                   | третий | 2    |
| 6 | Первая турбина                                     | третий | 2    |
| 7 | Примеры неисправностей                             | третий | 2    |
| 8 | Анализирование                                     | третий | 1    |

5. Необходимое оборудование для данного курса/ Equipment  
Не требуется/ not required

6. Контрольные точки данного курса/ Milestone

| № | Контрольные точки в деталях                                                                               |
|---|-----------------------------------------------------------------------------------------------------------|
| 1 | Контрольные вопросы после прохождения каждой главы<br>Question after each chapter                         |
| 2 | Тестирование после прохождения данного учебника<br>Test after Classroom lecture                           |
| 3 | Короткометражные видеоролики с «YouTube» по оборудованию<br>Short video clips from "YouTube" on equipment |
| 4 | Экскурсия по узлам основного оборудования<br>On-site tour of the main equipment                           |
| 5 |                                                                                                           |

7. Вопросы и типичные ответы для заключительного экзамена курса/ Q&A for the final course exam  
Подготовить, конкретные вопросы и типичные ответы для завершения экзамена курса, чтобы поддержать понимание курса, более 10 вопросов. Опишите конкретные вопросы и ответы на другой странице.  
Preparing concrete questions and typical answers for completing the course exam to confirm understanding of the course, more than 10 questions. Please describe concrete Q&A in another page.

Please clarify this specific Q&A/ section 9 before 12th mission

8. Критерии оценки слушателей/ Criteria

| № | Параметры                                                                                                                                                                     | Результат |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1 | Уровень понимания слушателя/ Attendee's level                                                                                                                                 |           |
| 2 | Количество заданных вопросов/Количество вопросов, заданных каждым стажером по каждому, и его качество<br>Number of questions asked from each trainee by each, and its quality |           |
| 3 | Понимание лекции, Результаты тестирования<br>Understanding of the lecture, results of completion examination                                                                  |           |

red character, commented by T. SAITO on April 16, 2018

9. Specific Q&A for course No 4(GT, combined power generation equipment)  
Конкретный список вопросов и ответов, курса №.4. Оборудование комбинированной генерации газовой турбины

Q&A should be more than 10 / Вопросы и ответы должны быть более 10

| No | Chapter<br>глава | Question/ Вопрос<br>(drawings separated/чертежи разделены)           | Typical answer/ Типичный ответ<br>(drawings separated/чертежи разделены)                                                                                                                                                                                                                                                     |
|----|------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  |                  | Части высокотемпературных элементов                                  | Камбастр, направляющие лопатки, рабочие лопатки                                                                                                                                                                                                                                                                              |
| 2  |                  | Части камбастра                                                      | Топливная форсунка, камеры сгорания, переходные патрубки                                                                                                                                                                                                                                                                     |
| 3  |                  | Температура горячего воздуха на входе и выходе турбины (из F4 марка) | 1400°C на входе<br>600°C на выходе                                                                                                                                                                                                                                                                                           |
| 4  |                  | Типы термостойких материалов                                         | Легированный сплав, легированный сплав, сс лопатка<br>сплав, полученный методом направленной кристаллизации ПС лопатки                                                                                                                                                                                                       |
| 5  |                  | Типы охлаждения                                                      | Конвективное охлаждение, (жидкостное охлаждение)<br>Пленочное охлаждение, Инжекционное охлаждение                                                                                                                                                                                                                            |
| 6  |                  | Типы инспекций                                                       | Непрерывный контроль(НК)<br>Разрушающий контроль(РК)                                                                                                                                                                                                                                                                         |
| 7  |                  | Типы тестирования по (НК)                                            | Визуальный контроль, контроль проникающими веществами, люминесцентный проникающий метод, Магнитно порошковый метод, исследование под микроскопом, исследование бороскопом, нагреточный метод, измерительный контроль, исследование микротрещин, Исследование структуры поверхности                                           |
| 8  |                  | Пример процесса ремонта при коррозии топливной форсунки              | Проверка внешнего диаметра<br>защитного покрытия –продукта (окисла алюминия)-очистка-проверка с помощью дороскопа-антикоррозийной мерной-назначительная проверка                                                                                                                                                             |
| 9  |                  | Промежуток рабочих часов между ремонтами турбины                     | Каждые 12000 часов                                                                                                                                                                                                                                                                                                           |
| 10 |                  | Замена лопаток горячей части                                         | Камера сгорания и переходной патрубок через 36,000 часов.<br>1,2,3 ступень рабочие и 1,2 ступень направляющие лопатки, 1,2 ступень сепараторы через 50,000 часов<br>3ступень направляющие и 3ступень сепараторы через 80,000 часов.<br>4 ступень направляющие, 4 ступень рабочие и 4 ступень сепараторы через 100,000 часов. |

- Trainer can use specific Q&A in training lecture, and for Examination of the course.



# Current Lecture Plan

► Current progress to create Lecture Plan is as follows.

| №  | Course name                                             | Chief Trainer in document |                  | Progress of Lecture Plan                                                                                                                                                                                                 |
|----|---------------------------------------------------------|---------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                         | 3rd Training JP           | in Lecture Plan  |                                                                                                                                                                                                                          |
| 1  | Nondestructive testing                                  | Makhmudov Aziz.           |                  | Prepared draft of Lecture Plan are including Specific Q&A.                                                                                                                                                               |
| 2  | Vibration analysis for rotating machine                 | Islamov Ismail            | No document      | Prepared draft of Lecture Plan are including Specific Q&A.<br><br>Chief Trainer described in draft of Lecture Plan, is different from proposed list of 3rd training in Japan, by NTC, for the course No3, No4, No7, No8. |
| 3  | Remaining life assessment                               | Aslonov Aslon             | Baylief Shukhrat |                                                                                                                                                                                                                          |
| 4  | Gas Turbine (GT)<br>Combined Power Generation Equipment | Musaev Alisher            | Khudoykulov L    |                                                                                                                                                                                                                          |
| 5  | GT Hot Parts Maintenance                                | Djamalov B.               |                  |                                                                                                                                                                                                                          |
| 6  | Details of Electrical Facilities for GT CCPP            | Toshov Sanjar             | Eshev Khamdam    |                                                                                                                                                                                                                          |
| 7  | Operation & Control Theory of GT CCPP                   | Toshov Istam              | Narziev Akmal    |                                                                                                                                                                                                                          |
| 8  | Details of Control & Instrument Devices for GT CCPP     | Narziev Akmal;            | Toshov Istam     |                                                                                                                                                                                                                          |
| 9  | GT Operation & Maintenance                              | Bazarov Faxriddin         |                  |                                                                                                                                                                                                                          |
| 10 | GT Control System                                       | Pirnazarov Nurali         |                  |                                                                                                                                                                                                                          |
| 11 | GT Electrical Control System                            | Parmonov Azim             |                  |                                                                                                                                                                                                                          |
| 12 | GT O&M lecture                                          | Musaev Alisher            |                  |                                                                                                                                                                                                                          |

► Lecture Plan will be revised according to feedback of training, annually.

# *On-Site Training*

# *On-Site Training*

- ▶ On-Site experiences, especially *experiences of periodical inspection, are required* for trainer candidates to become trainer.
- ▶ Unfortunately in Uzbekistan, there are very few opportunity to experience the periodical inspection of CCPP.
- ▶ In this project, JET cultivated trainer candidates within Training in Japan, with experiences of "Periodical inspection" at Japanese power company.
- ▶ All the *training in Japan*, 1st 2nd and 3rd, *were including "Periodical inspection" of CCPP* of CEPCO.
- ▶ After this Project, NTC should manage to implement On-Site Training to cultivate Trainer and/or manager.



# *On-Site Training in Japan*





# *On-Site Training in Japan*



Movie



# On-Site Training

► Potential of On-Site Training for upper class is recommended as under.

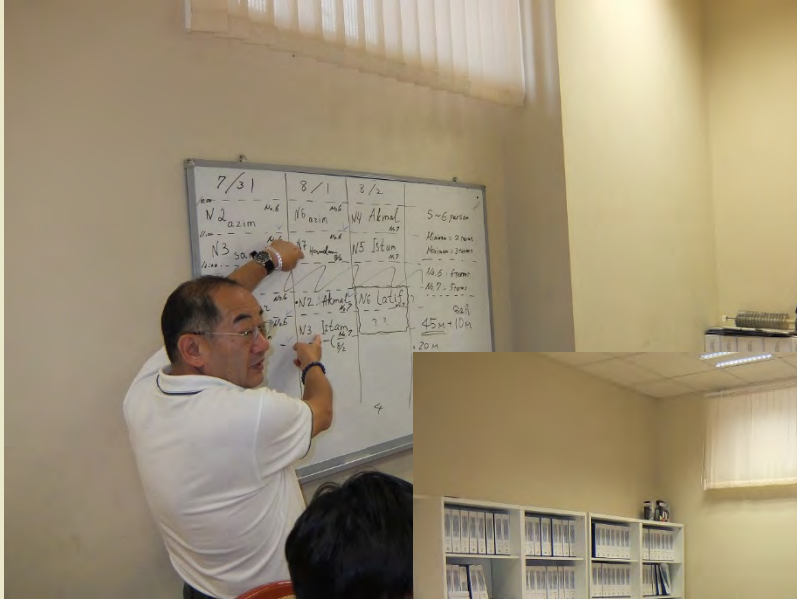
| Training Course/ Subject, and preferable condition |                                                                                         |                         |                         |                                                      |                        |                          |                                     |                                                    | by JET         |                   |   |
|----------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------|-------------------------|------------------------------------------------------|------------------------|--------------------------|-------------------------------------|----------------------------------------------------|----------------|-------------------|---|
| Text No. / Course Title                            | Training Level of course                                                                | Target field of trainee |                         | Potential of on-site training for <i>upper class</i> | Standard Training Days | Standard Trainees Number | Procured Training Equipment by JICA | Required Number of Trainer for the course/ subject |                |                   |   |
|                                                    |                                                                                         |                         |                         |                                                      |                        |                          |                                     | Chief Trainer                                      | Deputy Trainer | Assistant Trainer |   |
| Mechanical Field                                   |                                                                                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |   |
| 1                                                  | Non-destructive testing                                                                 | Elementary              | Mechanist               | Maintenance                                          | —                      | 2                        | 10                                  | ○                                                  | 1              | 1                 | 1 |
| 2                                                  | Vibration analysis for rotating machine                                                 | Intermediate            | Mechanist               | Maintenance                                          | —                      | 3                        | 10                                  | ○                                                  | 1              | 1                 | 1 |
| 3                                                  | Remaining life assessment                                                               | Intermediate            | Mechanist               | Maintenance                                          | —                      | 3                        | 10                                  | —                                                  | 1              | 1                 | — |
| 4                                                  | Gas Turbine; Combined power generation equipment                                        | Basic Common            | All Staff of CCPP       | Maintenance & Operation                              | effective              | 3                        | 10                                  | —                                                  | 1              | 1                 | — |
| 5                                                  | Gas Turbine; Hot Parts Maintenance                                                      | Intermediate            | Mechanist               | Maintenance                                          | effective              | 3                        | 10                                  | —                                                  | 1              | 1                 | — |
| Electrical Field                                   |                                                                                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |   |
| 6                                                  | Details of Electrical Facilities for Gas Turbine Combined Cycle Power Plant             | Intermediate            | Electrician             | Maintenance                                          | —                      | 4                        | 8                                   | ○                                                  | 1              | 1                 | 1 |
| 7                                                  | Operation & Control Theory of Gas Turbine Combined Cycle Power Plant                    | Basic Elementary        | Electrician & Mechanist | Maintenance & Operation                              | effective              | 3                        | 10                                  | —                                                  | 1              | 1                 | — |
| 8                                                  | Details of Control & Instrument Devices for Gas Turbine Combined Cycle Power Plant      | Intermediate            | Electrician C&I         | Maintenance                                          | effective              | 5                        | 8                                   | ○                                                  | 1              | 1                 | 1 |
| Equipment Field                                    |                                                                                         |                         |                         |                                                      |                        |                          |                                     |                                                    |                |                   |   |
| 9                                                  | Basic Gast Turbine Gas Turbine Operation & Maintenance                                  | Basic Common            | All Staff of CCPP       | Maintenance & Operation                              | effective              | 3                        | 15                                  | ○                                                  | 1              | 1                 | — |
| 10                                                 | CCGT Plant Operation & Maintenance Gas Turbine Control System                           | Basic Common            | Electrician & Mechanist | Maintenance & Operation                              | effective              | 3                        | 15                                  | —                                                  | 1              | 1                 | — |
| 11                                                 | Philosophy of GT electrical system and GT control Gas Turbine Electrical Control System | Basic Elementary        | Electrician             | Maintenance & Operation                              | effective              | 1                        | 15                                  | —                                                  | 1              | 1                 | — |
| 12                                                 | Gas Turbine Maintence Pholosophy and its commissioning Gas Turbine O&M Lecture          | Intermediate            | Electrician & Mechanist | Maintenance & Operation                              | —                      | 1                        | 15                                  | —                                                  | 1              | 1                 | — |

► 11



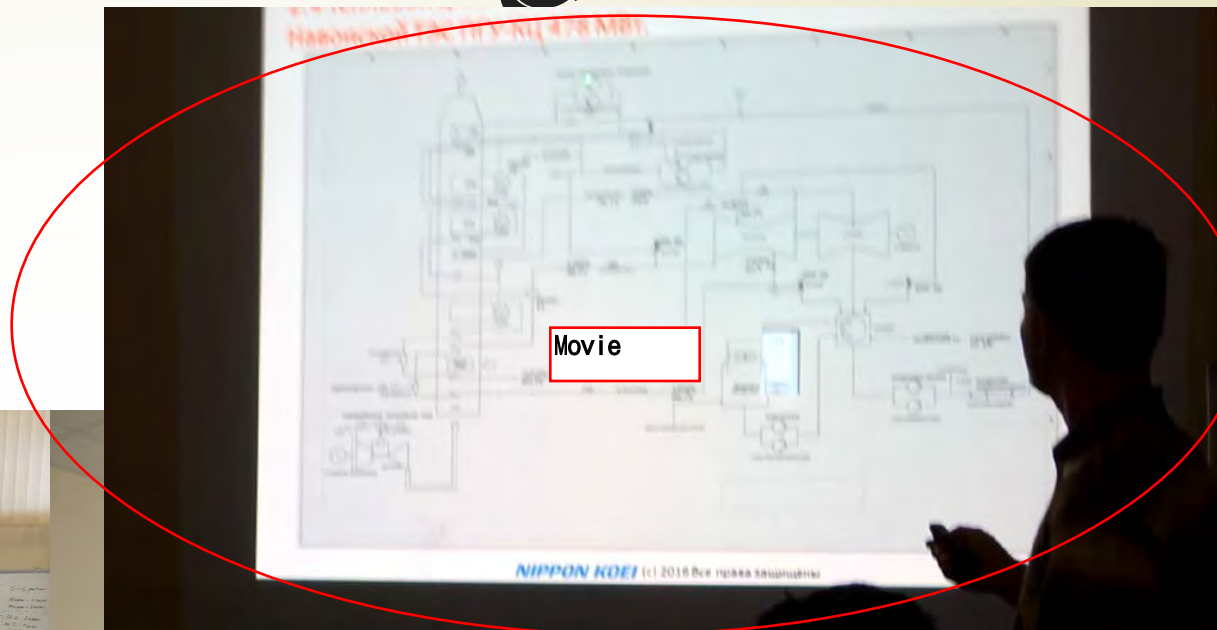
# *Mock-UIP Training*

# Mock-UIP Training in UZ





# Mock-UIP Training in UZ







# *Mock-Up Training*

- ▶ Mock-UP Training is the milestone to terminate cultivation of Trainer candidates.
- ▶ Trainer candidate experiences simulation of lecture as a trainer, and grown up to suitable trainer.
- ▶ After Mock-Up training, JET will interview trainer candidates, and will check they have adequate ability as a trainer, in this project. In the case after this project, Director NTC and Chief Trainer in charge will decide appointment of trainer. (The rule for trainer's appointment will be reported separate from this report.)

# Appreciate your cooperation

