

**MINUTES OF MEETING**  
**ON**  
**THE SEVENTH JOINT MANAGEMENT COMMITTEE**  
**AND**  
**THE FIFTH JOINT COORDINATION COMMITTEE**  
**IN**  
**THE TECHNICAL COOPERATION PROJECT**  
**ON**  
**ELECTRIC POWER TECHNICAL STANDARDS PROMOTION IN VIETNAM**

Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the eleventh mission of the project team and the Terminal Evaluation Mission (hereinafter referred to as “the JICA Evaluation Mission”) for the Technical Cooperation Project on Electric Power Technical Standards Promotion in Vietnam and held the seventh meeting of the Joint Management Committee (hereinafter referred to as “JMC”) and the fifth meeting of the Joint Coordination Committee (hereinafter referred to as “JCC”) with Vietnamese authorities concerned including Ministry of Industry and Trade (hereinafter referred to as “MOIT”), Ministry of Construction (hereinafter referred to as “MOC”) and Vietnam Electricity (hereinafter referred to as “EVN”) as follows:

Date and Time : April 24, 2013 8:30am-10:00am

Place : Meeting Room No 207 at MOIT

Participants: **MOIT:**

Science and Technology Dept.: Deputy Director General Mr. Phan Cong Hop, Mr. Nguyen Duy Hoa, Mr. Le Viet Cuong, Ms. Phan Cam Tu,

**MOC:**

Dept. of Science, Technology and Environment: Deputy Director General Dr. Tran Huu Ha,

**EVN:**

Science, Technology & Environment Dept.: Deputy Director Mr. Nguyen Quang Viet,

**JICA Headquarters:**

Energy and Mining Division 1, Industrial Development and Public Policy Department: Director Mr. Teruyuki Ito, Mr. Hidetaka Koseki

Consultant for Terminal Evaluation (under JICA): Ms. Hisami Nakamura,

**JICA Vietnam Office:**

Ms. Quynh Anh,

**JICA Project Team:**

Team Leader Mr. Shigeru Nakamura,

Team Member: Mr. Yasushi Furuyama, Mr. Mototaro Okada, Mr. Masashi Higo, Mr. Hiroshi Imamura, Mr. Masaaki Koga, Mr. Kenichi Kuwahara, Mr. Toshio Aki, Mr. Tsuguhiro Yamada,

Local Coordinator: Ms. Pham Hong Hai,

**Local Consultant:**

Electrical Testing Center No.1 (ETC1): Mr. To Tuan Anh, Mr. Trinh Van Yen, Mr. Nguyen Danh Duc, Mr. Nguyen Hoang Linh, Mr. Nguyen Quang Trung,

The Center for Water Research and Engineering Application (CRA): Dr. Le Quang Vinh,  
VINACONSULT: Dr. Cao Chan

The representatives of JICA, Vietnamese authorities concerned and the JICA Project Team discussed and agreed as follows:

## Contents:

### **1. Opening Remarks**

On behalf of MOIT, Mr. Hop gave an opening remark and introduced the participants of Vietnamese side in the 7<sup>th</sup> JMC/5<sup>th</sup> JCC Meeting.

On behalf of MOC, Dr. Ha gave an opening remark expressing appreciation for the opportunity of terminal evaluation of the Project and cooperation of JICA in the Project.

### **2. The 7<sup>th</sup> JMC Meeting**

#### **2.1 Current status of draft Guidelines (Report of JICA Project Team)**

JICA Project Team explained the current status of the draft Guidelines as follows:

(1) Hydropower part

Contents of the draft Guidelines Vol.4 and Vol.5 were agreed at the WG meeting in January 2013, and the JICA Team submitted the Final Draft Guideline for Approval to MOIT on March 15, 2013.

The draft Guideline for Technical Regulation on Hydropower Civil Works under the scope of MOC is still on the way of formulation by JICA Team, and the final draft will be submitted before the 8<sup>th</sup> JMC Meeting to be held in June 2013.

(2) Thermal Power part

JICA Team responded to the comments of Vietnamese side and reflected the opinion of JICA Team in the pre-final draft of Guidelines submitted in January 2013 and the Final Draft Guidelines for Approval submitted on March 15, 2013. The contents of the draft Guidelines Vol.2, Vol.4 and Vol.5 were finally agreed at the WG meetings in January and April 2013.

(3) Network part

JICA Team submitted Vol.1, Vol.3, Vol.4 and Vol.5 of the Final Draft Guidelines for Approval to MOIT on March 15, 2013. The output of the discussion in the 3<sup>rd</sup> Workshop in October 2012 and WG meetings in January 2013 have been reflected in the final draft.

#### **2.2 Current status of draft Technical Regulations (Report of JICA Project Team)**

JICA Project Team explained the current status of the draft Technical Regulations as follows:

(1) Hydropower part

Contents of the draft Technical Regulations Vol.4 and Vol.5 were agreed in the WG meetings held so far on the condition of some revisions, and the revised Final Draft will be submitted in June 2013.

The draft Technical Regulation on Hydropower Civil Works under the scope of MOC is still underway and is expected to be finalized by the end of April 2013.

(2) Thermal Power part

No comment has been received from Vietnamese side on the final draft Technical Regulations Vol.2, Vol.4 and Vol.5 submitted in June 2012, and the revised Final Draft will be submitted in June 2013 after correcting some minor mistakes in the previous version. JICA Team has provided the Vietnamese side with advices concerning the promulgation of Technical Regulations.

(3) Network part

JICA Team had submitted the revised draft of Technical Regulations Vol.1, Vol.3, Vol.4 and Vol.5 in August 2012, and made additional revisions based on the comments from Vietnamese side and results of discussions in the WG meetings in January 2013. JICA Team will further update and finalize the draft by the end of April 2013 and will submit the revised Final Draft in June 2013.

#### **2.3 Receipt of the draft Guidelines by JMC**

It is confirmed in this JMC meeting that the Vietnamese side agrees to receive the Final Draft for Approval of Guidelines Vol.1 to Vol.5 under the scope of MOIT submitted by JICA Project Team on March 15, 2013.

In the above regard, the Vietnamese side requests to JICA to support the Vietnamese side in the process of the further revision of the Guidelines if necessary during the 2 months period by the end of this Project.

## **2.4 Finalization of Draft Technical Regulations (Report of MOIT/MOC)**

Vietnamese side explained the status of finalization of the draft Technical Regulations as follows:

### **(1) MOIT**

Although some differences in the opinions between the Vietnamese side and JICA Team still remain in the thermal power part, MOIT will agree to receive the final draft of Technical Regulations in the JMC Meeting in June 2013. In addition, as the revision of the Electricity Law is planned to be promulgated in July 2013 and related legislative decrees will be enacted by MOIT, necessary revisions will be made on the draft Technical Regulations by Vietnamese side according to the stipulations in the new Electricity Law and related decrees.

### **(2) MOC**

The process of drafting the Technical Regulation on Hydropower Civil Works is in delay mainly due to the effect of incidents at Son Tranh 2 Hydropower Project of which precepts are being reflected in the stipulations of the draft Technical Regulations. Soon after the completion of drafting scheduled in April 2013, MOC will collect opinions of the relevant organizations on the draft, and then finalize the Technical Regulation for promulgation. MOC would ask JICA to give a support to MOC for finalizing the Technical Regulation.

## **2.5 Policy for dissemination of Guidelines**

JICA Project Team provided the Vietnamese side with the recommendations on policy for dissemination of Guidelines as follows:

- To disseminate the Guidelines through proper publishing measures by defining its status clearly as a voluntary reference document.

Vietnamese side explained the policy for dissemination of Guidelines as follows:

### **(1) MOIT**

MOIT recognizes that Guidelines will be helpful for EVN and IPP groups such as PV Power and Vinacomin Power as well as operators of power plants and network operation units. However, the measures for the dissemination of Guidelines which shall conform to the relevant laws and regulations are still under consideration.

### **(2) MOC**

MOC recognizes necessity of Guideline. The Guideline for Hydropower Civil Works to be proposed in this Project will be informative and helpful for MOC as a material for defining the specification of the project and also be useful for human resource development in Vietnam.

Vietnamese side will explain the measures to disseminate the Guidelines in the next JMC meeting to be held in June 2013.

## **3. The 5<sup>th</sup> JCC Meeting**

### **3.1 Report of JICA Terminal Evaluation Mission**

JICA Evaluation Mission explained the result of the evaluation as follows:

- (1) Mr. Ito, the leader of JICA Evaluation Mission, appreciated the efforts made by Vietnamese side to complete the Project and stated as follows:

JICA side requests the Vietnamese side to finalize by themselves the drafts of Technical Regulations and Guidelines proposed by JICA Team to be the documents effectively used in Vietnam.

Although the drafts of Technical Regulations and Guidelines have been proposed in this Project, the most important thing is to utilize and manage these documents effectively by updating and improving them consecutively. In order to achieve this target, it is recommended for Vietnamese side to continuously conduct the PDCA process.

- (2) The JICA Evaluation Mission proposed the PDM Version 3 by updating the indicators for Overall Goal as follows:

- No. of approved large-scale project after the promulgation of the Technical Regulations,
- No. of completion inspection reports to a committee concerned and No of order for improvement,
- Internal operational regulations according to the Technical Regulations prepared by facilities owned by EVN and other operators.

The Vietnamese side agreed to the revisions of the indicators for Overall Goal proposed in PDM Version 3.

### **3.2 Schedule of promulgation of Technical Regulations and dissemination of Guidelines**

The Vietnamese side confirmed the target schedule of promulgation of Technical Regulations and dissemination of Guidelines as follows:

- (1) Promulgation of Technical Regulations under MOIT scope: by the end of 2014
- (2) Promulgation of Technical Regulations under MOC scope: by the end of 2013
- (3) Dissemination of Guidelines under MOIT scope: by the end of 2014
- (4) Dissemination of Guidelines under MOC scope: by the end of 2014

### **3.3 Overall Conclusion on Terminal Evaluation Report**

Each party agreed to the contents of Joint Terminal Evaluation Report and the Minutes of Meeting of Terminal Evaluation and the minutes was signed by the representatives of MOIT, MOC and JICA as attached hereto:

### **4. Closing Remarks**

On behalf of MOIT, Mr. Hop gave an closing remark expressing the appreciation to the concerned organizations for their contribution to the Project and requesting further cooperation until the end of the Project to improve the quality of Project outputs, and also expressed the commitment to the post-Project activities to be done by the Vietnamese side including promulgation of Technical Regulations and dissemination of Guidelines which will contribute to the improvement of electric power sector in Vietnam.

On behalf of MOC, Dr. Ha gave an closing remark expressing appreciation to JICA for its cooperation and requesting further cooperation until the end of the Project in development of the first Technical Regulation and Guideline for Hydropower Civil Works which will contribute the improvement of quality and safety of hydropower civil structures in Vietnam.

On behalf of JICA Evaluation Mission, Mr. Ito expressed his appreciation to the strong commitment of Mr. Hop of MOIT and Dr. Ha of MOC to the activities required for the Vietnamese side and also expressed his expectation of successful achievement of the overall goal of the Project and further cooperation by JICA for improvement of the power sector in Vietnam.



**MOIT**  
Deputy Director General  
Science & Technology Dept.  
Mr. Phan Cong Hop



**MOC**  
Deputy Director General  
Dept. of Science, Technology  
& Environmental  
Dr. Tran Huu Ha



**JICA Project Team**  
Leader  
Mr. Nakamura Shigeru

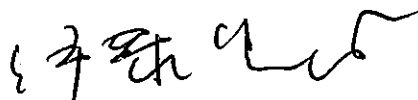
MINUTES OF MEETING  
BETWEEN  
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
THE SOCIALIST REPUBLIC OF VIETNAM  
AND  
JOINT TERMINAL EVALUATION TEAM OF  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
ON  
TECHNICAL COOPERATION PROJECT ON  
ELECTRIC POWER TECHNICAL STANDARDS PROMOTION PROJECT IN VIETNAM

The Terminal Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Teruyuki ITO visited the Socialist Republic of Vietnam (hereinafter referred to as "Vietnam") from April 14 to 25, 2013 for the purpose of conducting a terminal evaluation study on Electric Power Technical Standard Promotion Project in Vietnam.

During its stay in Vietnam, the Team had a series of discussions, exchanged views, and compiled a terminal evaluation report (hereinafter referred to as "the Report") with the authorities concerned of the Government of Vietnam over the matters for the completion and sustainability of the Project.

As a result of the discussions, both sides agreed upon the matters referred to in the document attached hereto.

Hanoi, April 24, 2013



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Mr. Teruyuki ITO  
Leader, Terminal Evaluation Team,  
Japan International Cooperation Agency



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Mr. Phan Cong HOP  
Deputy Director General  
Department of Science and Technology  
Ministry of Industry and Trade



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Dr. Tran Huu HA  
Deputy Director General  
Department of Science, Technology and  
Environment  
Ministry of Construction

## ATTACHMENT

### **1. Recognition of the Terminal Evaluation Report**

Both sides recognized that the Report was proper, and accepted the recommendations mentioned in the report.

### **2. Modification of Project Design Matrix (PDM)**

Based on the results of Terminal Evaluation, it is recommended to modify PDM Version2 for the completion of the Project Overall Goal. The proposed PDM Version 3 is attached to the Report. The proposed PDM shall be finalized and agreed by both Japanese and Vietnamese sides at a Joint Coordination Committee (JCC) scheduled on 24th April, 2013.

### **3. Sustainability of the Project**

(the Technical Regulations )

In order to ensure effectiveness and sustainability of the Project, promulgation of the revised Technical Regulations by MOIT and MOC is essential. Japanese side and Vietnam side agreed that MOIT and MOC will complete necessary procedures and process for promulgation by the end of 2014.

(the Technical Guideline)

At the same time, the Technical Guidelines should be useful reference to comply the revised Technical Regulations on site of power facilities. Vietnamese side needs to conduct refining works of the drafted Technical Guidelines prepared by the JICA expert team in order to increase their usability. Japan side and Vietnam side agreed that MOIT and MOC will complete necessary procedures and process for dissemination by the end of 2014.

Appendix : Terminal Evaluation Report

**JOINT TERMINAL EVALUATION REPORT**  
**ON THE TECHNICAL COOPERATION PROJECT**  
**ON**  
**ELECTRIC POWER TECHNICAL STANDARDS PROMOTION**  
**PROJECT IN VIETNAM**

**Ministry of Industry and Trade,**  
**Ministry of Construction**  
**And**  
**Japan International Cooperation Agency (JICA)**

**Hanoi**  
**The Socialist Republic of Vietnam**

**April 24th, 2013**

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- VII. Local Cost
- VIII. List of Counterparts



## **1. Framework of Terminal Evaluation Study**

### **1-1. Background and Objective of the Terminal Evaluation**

JICA has conducted “the Study on Technical Standards for Electric Power Industry in Vietnam” from May 2006 to July 2007 in order to support revision of the existing technical and safety regulations covering the electric power sector of Vietnam. As a result, in October, 2008, the new Technical Regulations and Safety Regulations based on the recommendations of the Study were promulgated. However, some problems on application of the new technical regulations at on site of power facilities were observed. While some power plants combined use of the new technical regulations and the old technical guidelines elaborated by the former Soviet Union, which had been already obsolete, other power plants operated the power facilities by their own judgment. Also, the revised technical regulations do not cover the large scale thermal power plants. Therefore, a technical cooperation project titled “Electric Power Technical Standards Promotion Project in Vietnam” was launched on March, 2010 in order to make further revision of the existing part of technical regulations and to newly elaborate the part covering the new field as well as technical guidelines. After the mid-term review study, the project period was extended to June, 2013.

Before ending the Project, the Joint Terminal Evaluation Study Team (hereinafter referred to as “the JICA Evaluation Team”) dispatched by Japan International Cooperation Agency (JICA) visited Vietnam from April 15-25, 2013 for the purpose of examining achievements and process of the Project by the “Five Evaluation Criteria” as well as figuring out necessary measures and activities after the completion of the Project. The Joint Terminal Evaluation Study (hereinafter referred to as “the Study”) has been jointly undertaken by the JICA Evaluation Team and the Vietnamese authorities concerned.

The objectives of the terminal evaluation study are as follows:

- (1) To review and assess the inputs, activities and achievements of the Project;
- (2) To evaluate the Projects by the five evaluation criteria of “Relevance”, “Effectiveness”, “Efficiency”, “Impact” and “Sustainability”;
- (3) To identify problems and issues to be addressed for successful implementation of the Project for the remaining period;
- (4) To propose recommendations for better implementation of the Project in the remaining period and for future activities to achieve the Overall Goal of the Project and to ensure sustainability of the project effects; and
- (5) To identify key driving forces and constraints for/against success of the Project for

drawing lessons learned for future technical cooperation projects.

### 1-2. Members of the Terminal Evaluation Study Mission

The JICA Evaluation Team is composed of the members as below.

|                         |                     |   |
|-------------------------|---------------------|---|
| Team Leader             | Mr. Teruyuki ITO    | Director<br>Energy and Mining Division I, Energy and Mining Group, Industrial Development and Public Policy Department, Japan International Cooperation Agency (JICA) |
| Cooperation Planning    | Mr. Hidetaka KOSEKI | Officer<br>Energy and Mining Division I, Energy and Mining Group, Industrial Development and Public Policy Department, JICA   |
| Evaluation and Analysis | Ms. Hisami NAKAMURA | Deputy General Manager<br>Business Promotion Department,<br>OPMAC Corporation   |

### 1-3. Schedule of the Terminal Evaluation Study

The JICA Evaluation Team visited Hanoi for the terminal evaluation study from 15<sup>th</sup> to 25<sup>th</sup>, April, 2013. The detailed schedule is as follows.

| Date  |     | Mr. Ito | Mr. Koseki | Ms. Nakamura  | Place   |
|-------|-----|---------|------------|---|---|
| April | 14  | sun     |            |   | <i>Depart from Narita (10:00) to Hanoi (14:05) (VN311)</i>  |
|       | 15  | mon     |            |   | <ul style="list-style-type: none"> <li>• Discussion with JICA Office</li> <li>• Interview with the project experts</li> <li>• Interview with counterparts of Vietnam</li> <li>• Data collection</li> <li>• Preparation for the evaluation report</li> </ul> |
|       | 16  | tue     |            |   |   |
|       | 17  | wed     |            |   |   |
|       | 18  | thu     |            |   |   |
|       | 19  | fri     |            |   |   |
| 20    | sat |         |            | Preparation for the Final Project Evaluation Workshop |   |

|  |    |     |  |  |
|--|----|-----|--|--|
|  | 21 | sun | <i>Depart from Narita to Hanoi(10:00) to Hanoi (14:05) (VN311)</i>   | and the minutes of meeting (M/M)                       |
|  | 22 | mon | <ul style="list-style-type: none"> <li>•Final Project Evaluation Workshop (8:30~11:30)</li> <li>•Preparation for the minutes of meeting (M/M) and the review report</li> </ul> |  |
|  | 23 | tue | <ul style="list-style-type: none"> <li>•Preparation for the minutes of meeting (M/M) and the review report</li> </ul>  |  |
|  | 24 | wed | <ul style="list-style-type: none"> <li>•AM: Signing of M/M at JCC</li> </ul>   |  |
|  | 25 | thu | <i>Depart from Hanoi (23:50) to Narita (6:55) VN3310</i>   | <i>Depart from Hanoi (0:30) to Narita (7:35) VN310</i> |

#### 1-4. Outline of the Project

The outline of the project is shown as follows. The Project Design Matrix Version 2(hereinafter referred to as “PDM Ver.2”) is shown in the Appendix I. The original PDM was revised as PDM Ver.2 at the Joint Coordination Committee in May, 2012 according to the recommendation by the Mid-term Review Study in February, 2012.

##### Overall Goal

The Electric Power Technical Standards\* and Guidelines shall be enforced to ensure improvement of reliability and safety of power supply in Vietnam.

\*According to the Law on Technical Regulations and Standards, the name of the technical documents to be promulgated should be the Electric Power Technical Regulations (QCVN) instead of “the Technical Standards.” Hereinafter referred to as “the Technical Regulations”

##### Project Purpose

Electric power Technical Standards and Guidelines are authorized by the Vietnamese authorities.

##### Outputs

1. Report of review on existing Technical Standards will be developed.
2. Drafts of the Technical Standards are developed.
3. Drafts for the Guidelines for Technical Standards are developed.

##### Activities

- 1.1 Collect existing Technical Standards, related documents and information
- 1.2 Review existing Technical Standards and related documents
- 1.3 Develop the report of review on inconsistency of existing Technical Standards and the resultant problems, and the necessities for improvement
- 2.1 Develop new Technical Standards by Working Groups (“WGs”)
  - WG: Hydro 2 (Under MOC): Design, Construction, Completion Inspection
  - WG: Thermal (Under MOIT): Design for Large-scaled Coal-fired Plant & Gas-combined Cycle
- 2.2 Make revision and addition into the existing Technical Standards by WGs

- WG: Hydro 1 (Under MOIT): Vol. 5 & 6
- WG: Thermal (Under MOIT): Vol. 5 & 6
- WG: Network (Under MOIT): Vol. 1-7 (including Grounding & Lightening Protection)

- 2.3 Review the final drafts of Technical Standards in English and Vietnamese comprehensively.
- 3.1 Prepare framework of Guidelines based on revised and developed Technical Standards by WGs
- 3.2 Develop Guidelines by WGs
- WG: Hydro 1 (Under MOIT)
  - WG: Hydro 2 (Under MOC)
  - WG: Thermal (Under MOIT)
  - WG: Network (Under MOIT)
- 3.3 Review the drafts of Technical Guidelines in English and Vietnamese comprehensively.

#### **1-5. Methodology of Terminal Evaluation**

The Study is carried out in accordance with the JICA Guidelines for Project Evaluation, along with the following process:

- (1) Assessing progress of the Project based on the plan shown in the Project Design Matrix (PDM) and the Plan of Operation (PO),
- (2) Analyzing the Project by the five evaluation criteria,
- (3) Proposing recommendations for further activities after the project completion,
- (4) Drawing lessons learned for other similar types of projects.,

Both quantitative and qualitative data and information were collected for the Study by the following methods.

- Review of the project reports and other relevant documents;
- Questionnaire and/or interviews to/with Japanese experts, Counterpart staff, and other stakeholders

The five evaluation criteria used for the analysis of the Project are as follows:

- (1) **Relevance:**  
Relevance of the Project is consistency of the Project Purpose and the Overall Goal with development policies and needs of Vietnam as well as the ODA policy of Japan towards Vietnam.
- (2) **Effectiveness:**  
Effectiveness of the Project is likelihood of achievement of the Project Purpose by the end of

the project period as a result of attaining outputs at the time of the Terminal Evaluation Study.

(3) Efficiency:

Efficiency of the Project is extent of conversion from the inputs to the outputs assessed from the aspects of achievement of the planned outputs as well as quantity, quality and timing of the inputs by the Japanese and Vietnamese sides.

(4) Impact:

Impacts of the Project are assessed by likelihood of achievement of the Overall Goal, which is the intended impact of the Project and positive and negative, direct and indirect effects resulted or to be resulted by the Project.

(5) Sustainability:

Sustainability of project is continuity of positive effects and benefits resulted by project after completion of project. It is assessed by the institutional, organizational, technical and financial aspects.

## 2. Project Performance and Implementation Process

### 2-1. Inputs

The inputs for the Project are shown in the Table 1.

**Table 1: Inputs for the Project (As of April, 2013)**

| Japanese Side   | Vietnamese Side  |
|---|--|
| ■Experts: 14 experts in 12 areas (83.68MM) in total<br>Long-term: 1 expert in 1 area (25.17MM)<br>Short-term: 13 experts in 11 areas (58.01MM) in total | ■Counterpart Personnel: 54 persons in total  |
| ■Training in Japan: 21 trainees received  | ■Equipment: 2 PCs  |
| ■Equipment: 0.572 million JPY<br>Foreign Currency: 0.373 million JPY<br>Local Currency: 42.439 million VND<br>(0.199 million JPY)                       | ■Land and Facilities: Project office space in MOIT   |
| ■Local Cost: 64.985 million JPY   | ■Local Cost: Administrative costs for WG activities, site surveys, workshops by EVN, and so forth, and cost for reviewing the drafts |

#### Japanese Side

Inputs by the Japanese side were increased in order to achieve the planned outputs.

One (1) long-term expert has been dispatched as a team leader and hydropower expert. Other eleven (11) experts were dispatched in short-term basis for the areas of hydropower (civil works, hydro-mechanical equipment, electrical works, and mechanical equipment), thermal power plant (mechanical equipment and electrical works), and network (transmission system, substation system, distribution system, grounding system, inspection, and network support). The inputs of the Japanese experts were increased according to the extension of the project period. In particular, more experts in network system were dispatched in order to cope with the larger scope and workload. The list of experts is attached as Appendix IV.

Three (3) training courses of hydropower, thermal power and network were implemented during the period from March to November, 2011. The list of trainees received in Japan is attached as Appendix V.

The equipment provided by the Japanese side are office appliances, including projectors and a personal computer. The list of equipment is attached as Appendix VI.

The local cost borne by the Japanese side of 64.985 million JPY spend for contracts for local consultants and general activities. The local consultants contracted by the JICA expert team have been engaged in assignments for compiling the drafts of the Technical Regulations and the

Guidelines of the MOIT scope, such as reviewing the drafts in Vietnamese language, participating the workshops and meetings of the WGs, coordinating comments from the Vietnamese sides, giving advices to the Japanese experts, and so on. The details of local cost are attached as Appendix VII.

### Vietnamese Side

Inputs by the Vietnamese side were as planned.

The Vietnamese Side assigned counterpart personnel for the Joint Coordination Committee (JCC), the Joint Management Committee (JMC) and four Working Groups (WG) of the Hydropower 1 the Hydropower 2, the Thermal Power and the Network. The counter personnel belong to key stakeholders of the Project, including, the Ministry of Industry and Trade (MOIT), the Ministry of Construction (MOC), the Ministry of Agriculture and Rural Development (MARD), Electricity of Vietnam (EVN), and the Center for Water Research and Engineering Application (CRA). While MOIT supervises technical issues on the power industry in general, MOC and MARD are responsible for technical issues on civil works of water facilities, including hydropower plants. The list of counterpart personnel is attached as Appendix VIII.

The project office space has been provided by MOIT. MOIT, MOC and EVN covered necessary administrative cost to hold meetings for JMC, JCC, and WGs, site surveys, workshops by EVN and so forth and cost for reviewing the drafts

### **2-2. Progress of Activities**

For the period from March, 2010 to April, 2013, the JICA expert team worked on drafting the Technical Regulations in Japan. Base on the drafts prepared by the JICA expert team, each WGs, including JICA expert team and the key stakeholders of the Vietnamese side, discussed the contents of the Technical Regulations and the Guidelines and reflected comments from stakeholders in the electric power sector. During that period, four (4) JCCs and seven (7) JMCs were held while details of drafted Technical Regulations were discussed at WGs.

In terms of the MOC scope, the review works of the Technical Regulations (the Vietnamese Version) has been still ongoing and not finalized yet. MOC organized workshops to hold hearings of opinions from the stakeholders which promoted larger involvement of the Vietnamese side. On the other hand, it took certain time to establish and activate the institutional arrangement and made a delay of the activities planned in the first year of the Project. In addition, some accidents of the existing dam for hydropower plant in Vietnam, such as leaks of water and earthquakes swam activities which have been suspected of reservoir-induced quakes, provoked anxieties of the inhabitants in the lower basins and raised MOC awareness of safety regulations on dams. It promoted deeper discussions about the Technical Regulations of the MOC scope related to design and construction of hydropower facilities, including dams. Therefore, it took longer time to finalize the draft of the Technical Regulations than the schedule.

In terms of the MOIT scope, the review works of the Technical Regulations (the Vietnamese Version) has been ongoing as well. The issue of linguistic interface, including quality of the English Version of drafts, quality of translation in Vietnamese, English ability of the Vietnamese side and limits of technical terms in Vietnamese language, constrained the review and refinement works. However, both efforts on quality control of the drafts improved the productivity of review and refinement works. In particular, the newly contracted local consultant for the Network WG facilitated well the review works of the Vietnamese version of drafts.

**Table 2: Major Activities Carried Out by the Project (as of April, 2013)**

| Period                         | JICA Team   | WGs  |
|--------------------------------|---|--|
| March, 2010                    | <ul style="list-style-type: none"> <li>● Reviewing existing documents</li> <li>● Drafting a work report</li> </ul>                                  | <ul style="list-style-type: none"> <li>● 1<sup>st</sup> JMC</li> <li>● 1<sup>st</sup> WGs</li> <li>● Finalization of the work report</li> </ul>  |
| May, 2010                      | <ul style="list-style-type: none"> <li>● Reviewing existing documents</li> <li>● Drafting review reports</li> </ul>                                 |  |
| June – July, 2010              |   | <ul style="list-style-type: none"> <li>● 2<sup>nd</sup> WGs</li> <li>● Site surveys</li> <li>● 3<sup>rd</sup> WGs</li> <li>● 2<sup>nd</sup> JMC</li> <li>● Finalization of review reports</li> <li>● Drafting a framework of technical standards</li> </ul>  |
| September, 2010                | <ul style="list-style-type: none"> <li>● Reviewing existing documents</li> <li>● Preparing 1<sup>st</sup> draft of technical regulations</li> </ul> |  |
| October, 2010                  |   | <ul style="list-style-type: none"> <li>● 4<sup>th</sup> WGs</li> <li>● Reviewing additional documents and information</li> <li>● Reviewing results of baseline survey on accidents and failures of electric power facilities</li> <li>● Site surveys</li> <li>● 5<sup>th</sup> WGs to review the 1<sup>st</sup> draft</li> </ul>   |
| November, 2010 – January, 2011 | <ul style="list-style-type: none"> <li>● Reviewing existing documents</li> <li>● Preparing 2<sup>nd</sup> draft of technical regulations</li> </ul> |  |
| February – March, 2011         |   | <ul style="list-style-type: none"> <li>● 6<sup>th</sup> WGs to discuss the 2<sup>nd</sup> draft</li> <li>● 3<sup>rd</sup> JMC</li> <li>● Site surveys</li> <li>● 7<sup>th</sup> WG (hydro-1) to confirm revisions of the 2<sup>nd</sup> draft</li> <li>● 1<sup>st</sup> Workshop to consult with stakeholders before finalization of the draft of technical regulations</li> <li>● 7<sup>th</sup> WG (thermal)</li> <li>● 8<sup>th</sup> WG (hydro-1)</li> <li>● 7<sup>th</sup> and 8<sup>th</sup> WG (network)</li> <li>● 7<sup>th</sup> WG (hydro-2)</li> <li>● 9<sup>th</sup> WG (hydro-1)</li> </ul> |
| April- May, 2011               | <ul style="list-style-type: none"> <li>● Preparing final draft of technical regulations</li> </ul>  |  |
| June-July, 2011                | <ul style="list-style-type: none"> <li>● Preparing final draft of technical regulations</li> </ul>  | <ul style="list-style-type: none"> <li>● 2<sup>nd</sup> Workshop</li> <li>● 8<sup>th</sup> WG (thermal)</li> <li>● 9<sup>th</sup> WG (network)</li> <li>● 10<sup>th</sup> WG (hydro-1)</li> <li>● 4<sup>th</sup> JMC and 1<sup>st</sup> JCC</li> </ul>   |
| August, 2011                   | <ul style="list-style-type: none"> <li>● Submission of final draft of technical regulations</li> </ul>  |  |



| Period                         | JICA Team   | WGs   |
|--------------------------------|---|---|
| September - October 2011       | <ul style="list-style-type: none"> <li>● Preparation of preliminary draft guidelines</li> <li>● Preparation of final draft technical regulations for hydropower civil works (MOC)</li> </ul>  |   |
| November, 2011                 |   | <ul style="list-style-type: none"> <li>● 2<sup>nd</sup> JCC and 5<sup>th</sup> JMC</li> <li>● 11<sup>th</sup> -13<sup>th</sup> WG (hydro-1)</li> <li>● 8<sup>th</sup> WG (hydro-2)</li> <li>● 10<sup>th</sup> -18<sup>th</sup> WG (network)</li> <li>● 9<sup>th</sup> -11<sup>th</sup> WG (thermal)</li> </ul>                              |
| December, 2011 – January, 2012 | <ul style="list-style-type: none"> <li>● Reviewing the final draft technical regulation</li> <li>● Preparation of 1<sup>st</sup> draft Guideline</li> </ul>   | <ul style="list-style-type: none"> <li>● Reviewing the final draft technical regulation</li> <li>● MOC Workshop</li> </ul>  |
| February, 2012                 | <ul style="list-style-type: none"> <li>● Reviewing the final draft technical regulation</li> <li>● Preparation of 1<sup>st</sup> draft guidelines</li> </ul>  | <ul style="list-style-type: none"> <li>● General WG</li> <li>● Midterm evaluation workshop</li> <li>● 3<sup>rd</sup> JCC</li> </ul>   |
| March – April, 2012            | <ul style="list-style-type: none"> <li>● Reviewing the final draft technical regulation</li> <li>● Submission of the 1<sup>st</sup> draft guideline (Hydro Vol.4, Vol.5, Thermal Vol.2, Vol.5, Network Vol.3, Vol.4)</li> </ul>   | <ul style="list-style-type: none"> <li>● Reviewing the final draft technical regulation</li> <li>● Collection and consolidation of comments on final draft technical regulation</li> </ul>  |
| May, 2012                      |   | <ul style="list-style-type: none"> <li>● 14<sup>th</sup> - 15<sup>th</sup> WG (hydro-1)</li> <li>● MOC Workshop</li> <li>● 9<sup>th</sup> WG (hydro-2)</li> <li>● 12<sup>th</sup> - 15<sup>th</sup> WG (thermal)</li> <li>● 20<sup>th</sup> - 23<sup>rd</sup> WG (network)</li> <li>● 4<sup>th</sup> JCC</li> </ul>                         |
| June – September, 2012         | <ul style="list-style-type: none"> <li>● Preparation of the 1<sup>st</sup> and 2<sup>nd</sup> draft guidelines</li> <li>● Submission of the 1<sup>st</sup> and 2<sup>nd</sup> draft guideline (Common Vol.4, Hydro Vol.4, Vol.5, Thermal Vol.2, Vol.4, Vol.5, Network Vol.1, Vol.3, Vol.4, Vol.5)</li> <li>● Submission of revised final draft technical regulations</li> </ul> | <ul style="list-style-type: none"> <li>● 24<sup>th</sup> - 27<sup>th</sup> WG (network)</li> <li>● 16<sup>th</sup> - 17<sup>th</sup> WG (hydro-1)</li> <li>● 28<sup>th</sup> -29<sup>th</sup> WG (network)</li> <li>● 16<sup>th</sup> - 19<sup>th</sup> WG (thermal)</li> <li>● 30<sup>th</sup> WG (network)</li> </ul>                     |
| October, - November, 2012      | <ul style="list-style-type: none"> <li>● Preparation of pre-final draft guidelines</li> </ul>   | <ul style="list-style-type: none"> <li>● 18<sup>th</sup> WG (hydro-1)</li> <li>● 20<sup>th</sup> WG (thermal)</li> <li>● 31<sup>st</sup> WG (network)</li> <li>● 3<sup>rd</sup> Workshop</li> <li>● 6<sup>th</sup> JMC</li> <li>● Collection and consolidation of comments on 1<sup>st</sup> and 2<sup>nd</sup> draft guidelines</li> </ul> |
| December, 2012                 | <ul style="list-style-type: none"> <li>● Review of comments and preparation of pre-final draft guidelines</li> </ul>  |   |
| January, 2013                  | <ul style="list-style-type: none"> <li>Submission of 1<sup>st</sup> draft guideline (hydropower civil works)</li> </ul>   | <ul style="list-style-type: none"> <li>● 19<sup>th</sup> - 20<sup>th</sup> WG (hydro-1)</li> <li>● 10<sup>th</sup> WG (hydro-2)</li> <li>● MOC Workshop</li> <li>● 32<sup>nd</sup> WG (network)</li> <li>● 21<sup>st</sup> -22<sup>nd</sup> WG (thermal)</li> </ul>   |
| February - March, 2013         | <ul style="list-style-type: none"> <li>● Preparation of final draft guidelines</li> <li>● Submission of final draft guideline for Approval (Vol.1 to Vol.5)</li> </ul>  |   |
| April, 2013                    |   | <ul style="list-style-type: none"> <li>● 21<sup>st</sup> WG (hydro-1)</li> <li>● 23<sup>rd</sup> WG (thermal)</li> <li>● 33<sup>rd</sup> WG (network)</li> <li>● Terminal evaluation workshop</li> <li>● 7<sup>th</sup> JMC and 5<sup>th</sup> JCC</li> <li>● MOC Workshop</li> </ul>   |

### 2-3. Achievement of Outputs

By the time of the terminal evaluation study in April, 2013, the Project achieved the Output 1, mostly achieved the Output 2, and will be achieved the Output 3 by June, 2013 before the end of the project period.

The Output 1 to develop a review report on the existing Technical Regulations was achieved in July, 2010 as planned.

In terms of the Output 2, the English version of the final drafts of the Technical Regulations of MOIT scope was submitted to JMC by August, 2011. After that, these drafts were reviewed by the Vietnamese expert team and the JICA expert team carried out the review works to reflect the comments from the Vietnamese side. Then, the refinement works to finalize the drafts for promulgation has been continuing under the discussions between the JICA expert team and the Vietnamese expert team. The final draft of the Technical Regulations of MOC scope will be completed by the end of April 2013. The works for the MOC scope and the MOIT scope will be completed by May, 2013.

In terms of Output 3, the final drafts of the Technical Guidelines of the MOIT scope were submitted in March, 2013. The review works of the drafts by the Vietnamese side are needed to make them usable on site of the power facilities. .

**Table 3: Achievement of Outputs in PDM Ver.2 (as of April, 2013)**

| Outputs  | Verifiable Indicators  | Achievement   |
|--|--|---|
| 1. Report of review on existing Technical Standards will be developed. | The report is approved by JMC by July, 2010.   | Achieved as planned.  |
| 2. Drafts of the Technical Standards are developed.                    | 2.1. The final drafts of the Electric Power Technical Standards in English are submitted to JMC by August, 2011<br><br>2.2. The final draft of the Technical Standards of the MOIT scope in Vietnamese is refined by the MOIT expert team by May, 2013.<br><br>2.3. The final draft of the Technical Standards of the MOC scope in Vietnamese is refined by the MOC expert team by June, 2012. | Achieved as planned except for the Technical Regulation of MOC scope. The following parts of the Technical Regulations submitted to JMC.<br><ul style="list-style-type: none"> <li>• Vol.1 (Design of network facilities)</li> <li>• Vol.2 (Design of thermal power facilities)</li> <li>• Vol.3 (Construction of network facilities)</li> <li>• Vol.4 (Operation of hydropower, thermal power and network facilities)</li> <li>• Vol.5 (Inspection of hydropower, thermal power and network facilities)</li> </ul> Mostly achieved and likely to be achieved by May, 2013.<br><br>Mostly achieved but delayed from the target deadline. Likely to be achieved by the end of May, 2013. |
| 3. Drafts of the Guidelines for  | 3.1 The final drafts of the Electric Power Technical Guidelines are  | Mostly achieved by submitting the final draft for approval in March 2013, and   |

| Outputs                            | Verifiable Indicators   | Achievement  |
|------------------------------------|---|--|
| Technical Standards are developed. | submitted to JMC by May 2013.<br>3.2 The final draft of the Technical Guidelines of the MOIT scope is refined by the MOIT expert team by the end of May, 2013.<br>3.3 The final draft of the Technical Guidelines of the MOC scope is refined by the MOC expert team by the end of May, 2013. | likely to be achieved by June, 2013<br>.Mostly achieved, and the drafts will be accepted by JMC in June, 2013. Further refining works will be taken by the Vietnamese side.<br>Not achieved yet, and the draft will be accepted by JMC in June, 2013. Further refining works will be taken by the Vietnamese side. |

#### 2-4. Achievement of Project Purpose

The Project Purpose was revised at JCC in May, 2012 from the one in the original PDM Ver.1 to “authorization of the Electric Power Technical Standards and Guidelines by the Vietnamese authorities” in the PDM Ver.2. The Project Purpose is likely to be achieved by the end of the project period despite of the delay of the scheduled activities.

The Technical Regulations of the MOIT scope have been under the refining works and will be approved by JMC by June, 2013. In terms of the Technical Guidelines of the MOIT scope, the refining works by the Vietnamese side will be required after the final version of the drafts prepared by the JICA expert team are accepted by JMC by the end of the Project.

In terms of the MOC scope, the Technical Regulations have not been promulgated yet though the promulgation has been scheduled in June, 2012 in the revised PDM Ver.2. The delay was due to the safety issue of dams provoked by some incidents at the existing dam sites as mentioned above. However, the process of promulgation of the Technical Regulations is likely to be commenced by June, 2013 and the final draft of the Guidelines will be accepted by JMC by the end of the Project.

**Table 4: Achievement of the Project Purpose in PDM Ver.2**

| Project Purpose   | Verifiable Indicators  | Achievement   |
|---|--|---|
| The Electric Power Technical Standards and Guidelines are authorized by the Vietnamese authorities. | 1. The final draft of the Electric Power Technical Standards in the scope of MOIT is approved by JMC by June, 2013.<br>2. The final draft of the Electric Power Technical Guidelines in the scope of MOIT is approved by JMC by June, 2013.<br>3. The Technical Standards concerning civil works of hydropower plants in the scope of MOC is promulgated by the end of 2012. | Not achieved yet and the final draft will be accepted by JMC in June, 2013 as planned.<br>Not achieved yet and the final drafts prepared by the JICA expert team are likely to be accepted by June, 2013 as planned.<br>Not achieved yet and MOC likely to commence a promulgation process by June, 2013. |

- |   |   |
|---|---|
| 4. The final draft of Technical Guidelines concerning civil works of hydropower plants in the scope of MOC is approved by JMC by June 2013. | Not achieved yet and the final draft will be accepted by JMC in June, 2013. |
|---|---|

**2-5. Prospects for Achievement of Overall Goal**

The Overall Goal was also revised in PDM Ver.2. Enforcement of the Technical Regulations under the both scopes of MOIT and MOC is likely to be achieved by the end of 2014. However, more adequate verifiable indicators should be determined as mentioned in PDM Ver.2.

In terms of the promulgation of the Guidelines, there are discussions about characterization of the Guidelines. Namely, while one opinion proposes that the Guidelines should be supplement to the Technical Regulations (QCVN) as enforceable documents, other opinion suggests that they should be references of the Technical Regulations to help adequate practices on site. Therefore, the indicators to verify utilization of the Guidelines by the operators of power facilities, including power plants and network systems, may be better than to verify promulgation of the Guidelines.

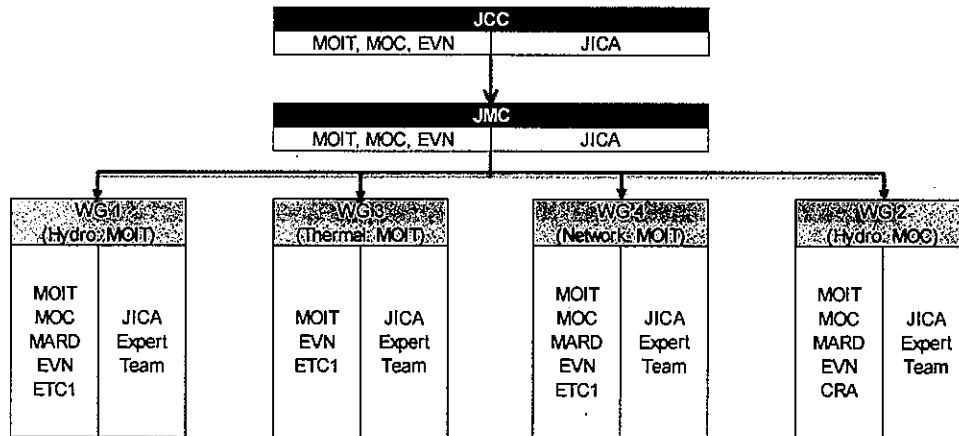
Also, it is necessary to specify more realistic indicators for verification of compliance of the Technical Regulations by the operators of power facilities in the light of the current monitoring system and feasibility of data collection methodology.

**Table 5: Prospects for Achievement of the Overall Goal in PDM Ver.2**

| Overall Goal   | Verifiable Indicators  | Prospects for Achievement   |
|--|--|---|
| The Electric Power Standards and Guidelines shall be enforced to ensure improvement of reliability and safety of power supply in Vietnam | <p>(Details will be specified in the terminal evaluation)</p> <ol style="list-style-type: none"> <li>1. The Electric Power Technical Standards and Guidelines are promulgated by MOIT by the end of 2014.</li> <li>2. The Technical Guidelines concerning civil works of hydropower plants is promulgated by MOC by the end of 2014.</li> <li>3. Designs of newly constructed electric power facilities are permitted according to the Electric Power Technical Standards and Guidelines.</li> <li>4. Completion inspections of newly constructed electric power facilities are conducted according to the Electric Power Technical Standards and Guidelines.</li> <li>5. Regular inspections on operation and maintenance of electric power facilities are conducted and reported by operators to MOIT according to the Electric Power Technical</li> </ol> | Highly expected to be achieved by the end of 2014. For verification, the proposed indicators in the PDM Ver.2 need to be replaced by more adequate ones in the light of feasibility of data collection. |

## 2-6. Implementation Process

The Project has been implemented by the structure shown in the Figure 1.



**Figure 1: Implementation Structure**

The Project set up four WGs: the Hydro Power 1, the Hydro Power 2, the Thermal Power and the Network. While the Hydro Power 2 is responsible for the scope of MOC, the other WGs are responsible for the scope of MOIT. The WGs are composed of the JICA expert team and the counterparts and experts of the Vietnamese side. The main task of the WGs is reviewing and refining the contents of the Technical Regulations and Guidelines in order to compile the final drafts and reporting their outputs to the JMC.

For implementation of the Project, the JMC and the JCC were also established. Whereas the JCC is responsible for process of promulgation of the Technical Regulations and Guidelines drafted by the Project and provision of overall supports for the Project, the JMC is responsible to manage the project activities and to approve the outputs by the Project.

In order to efficiently draft the Technical Regulations, it was planned that the JICA expert teams was going to work on drafting the Technical Regulations and Guidelines in Japan and the WGs were going to review and finalize the drafts prepared by the JICA expert teams. However, as pointed out by the Joint Mid-term Review report, productivity of the implementation arrangement did not function well as expected due to the limited interface between the two languages of English and Vietnam, including quality of Vietnamese translations and the larger workloads of drafting and reviewing of the drafts. In addition, among the Vietnamese stakeholders, the discussions and

coordination were not sufficient to compile constructive comments to refine the drafts of the Technical Regulations and facilitate the scheduled activities.

According to the recommendations proposed by the Joint Mid-term Review Study Report, the both sides of the JICA expert team and the Vietnamese expert team made efforts to improve and facilitate the reviewing and refining works of the drafted Technical Regulations and Guidelines. In particular, the experienced local consultant for the Network WG greatly contributed to their productivity to refine the drafts.

### **3. Evaluation by Five Evaluation Criteria**

#### **3-1. Relevance**

Relevance of the Project is high and it is expected to keep the relevance until the end of the Project.

##### **(1) Consistency with the development needs of Vietnam**

According to the latest forecast, the power demand of Vietnam is expected to reach 329,400GWh in 2020.

In order to meet the growing power demand, construction of electric power facilities, including power plants, transmission lines and substations, has been promoted under the National Power Development Plan for 2011-2020 period with vision to 2030 (PDP VII: Power Master Plan VII) which was approved by the Prime Minister of Vietnam in July 2011. In addition, the government of Vietnam has been implementing the power sector reform, including liberalization of the power market.

Under such situation, reliable and safe supply of electric power is a key issue in the power sector of Vietnam. Therefore, revision and development of the Electric Power Technical Regulations and Guidelines is consistent with the development needs of Vietnam for improvement of reliability and safety of power supply through compliance of adequate technical regulations.

##### **(2) Adequacy of Project Approach and Design**

JICA supported to revise the Volume 5 to 7 of the existing technical regulations through the Development Study conducted from May, 2005 to June, 2007. The revised volumes of the technical regulations and the safety regulations were promulgated in December, 2009. However, it has been still necessary to revise the rest of parts of the technical regulations and to develop additional technical regulations and guidelines in order to ensure reliability and safety of power supply. Thus, the project approach and design to revise and develop adequate technical regulations and guidelines for the power industry in Vietnam is adequate to meet the needs of Vietnam.

##### **(3) Consistency with the Japanese ODA policy**

The Country Assistance Program for Vietnam, which was developed by the government of Japan, sets forth the priority areas for the Official Development Assistance (ODA) by Japan. "Stable supplies for resource of energy" is one of the priority areas. It is expected that the Project will contribute to stable power supply through compliance of appropriate technical standards and guidelines for the power industry in Vietnam. Therefore, the Project is consistent with the Japanese ODA policy.

#### **3-2. Effectiveness**

At the time of the Terminal Evaluation Study, effectiveness of the Project can be fair.

Although the planned outputs and the Project Purpose are likely to be mostly achieved by June, 2013, the refining works of the drafted Technical Guidelines by the Vietnamese side will still remain after the project period in order to increase their usability for the operators of the power facilities

### **3-3. Efficiency**

Efficiency of the Project is fair.

In order to achieve the planned outputs and the Project Purpose, the inputs by the Japanese Side, including the Japanese experts and the expenses to cover the cost of local consultants, increased. Also, the project period was extended from the original schedule ending March, 2013 to June, 2013.

At the first stage, while the limited interface of two languages between English and Vietnamese increased workload to review and refine the drafts of the Technical Standards and the Guidelines, the limited engagement of the Vietnamese expert team constrained the effective and efficient review and refinement works of the Project.

At the second stage, however, the implementation arrangement was improved. In particular, the local consultant supporting the Network WG facilitated the review and refinement work to finalize the drafts of the Technical Standards and the Guidelines. The improvement of implementation arrangement ensured achievement of the outputs and the Project Purpose and a certain level of efficiency of the Project.

### **3-4. Impact**

#### **(1) Achievement of Overall Goal**

The Overall Goal is likely to be achieved as mentioned above though it is necessary to specify more adequate verifiable indicators.

#### **(2) Other impact**

At the time of the Terminal Evaluation Study, any positive or negative impacts were not observed.

### **3-5. Sustainability**

In the case of the Project, sustainability can be verified by compliance of the Technical Regulations after promulgation and dissemination and application of the Technical Guidelines. Also timely updating and revision of these documents by MOIT and MOC is a key to ensure sustainability. The sustainability of the expected Project effects can be ensured by the necessary measures to be taken.

#### **(1) Policy /institutional aspect**



Since the Technical Regulations will be enforceable document by promulgation, the stakeholders, including EVN and other operators of power facilities, in the electric power industry are required to comply with them. Also the Law on Technical Regulations and Standards stipulates criteria to update and inspect the Technical Regulations and Guidelines. Therefore, the legislative system in Vietnam endorses dissemination and compliance of the Technical Regulations as well as necessary updates.

If the Guidelines are not promulgated, they cannot be enforceable document but become reference for the revised Technical Regulations. Even in that case, it is expected that the Guidelines will be utilized for practice of the revised Technical Regulations on site of power facilities.

### (2) Organizational aspect

After promulgation of the Technical Regulations, MOIT and MOC are responsible to disseminate them to the public through the three channels: ministerial official documents, website of ministry, and workshops or trainings. The minimum requirement to disseminate the Technical Regulations and Guidelines shall be fulfilled by MOIT and MOC. The workshops and trainings on the revised Technical Regulations can enhance dissemination and compliance more practically.

For monitoring of compliance of the Technical Regulations, there are some reporting systems from project owners/operators to MOIT/MOC but not specific ones to check compliance of the Technical Regulations. Also, inspection team of MOIT/MOC and other relevant ministries carries out site inspection on random basis and in the case of troubles. However, there are difficulties to conduct detail monitoring to cover all the project owners and operators by the limited number of staff who are engaged in various assignments simultaneously.

In terms of updates of the Technical Regulations and Guidelines, MOIT and MOC can mobilize necessary human resources for expert team from the other stakeholders and other institutions despite that the ministries do not have enough technical experts.

Thus, it seems that there is no serious constraint against the sustainability of the expected effects resulted by the Project from the organizational aspects.

### (3) Technical aspect

MOIT and MOC have capable officers with enough experience in compiling revisions and developments of technical regulations. Also, experts of EVN, ETC, CRA and local consultants have sufficient level of technical knowledge and experiences to review technical regulations.

In addition, according to the WG members from EVN, EVN elaborated their own internal operational regulations by themselves according to the international technical standards. It can be

an evidence for the capacity of the Vietnamese side to revise the Technical Guidelines and to apply the revised Technical Regulations for their power facilities.

(4) Financial aspect

It is expected that MOIT and MOC can allocate enough budget to disseminate and to update technical regulations because they have carried out revision and promulgations of other technical regulations. In particular, MOIT revised the Volume 1-4 of the existing technical regulations before the Project. Also, MOC allocates annual budget of around 324 million VDN (approximately 20,000 USD) for dissemination which can cover the cost of workshops at 3-4 places. Therefore, financial issues may not harm sustainability of the Project.

**3-6. Conclusion**

Since the Project has been consistent with development needs of Vietnam and the Japanese ODA policy, the Project keeps high relevance. The improvement of implementation arrangement of the Project enables to mostly achieve the planned outputs and the Project Purpose, and increase effectiveness of the Project. On the other hand, although efficiency of the Project was improved by the improvement of implementation arrangement, the limited interface of languages increased the workload of reviews and refinements of the drafts which required the longer term of the Project than the original plan. The promulgation of the revised Technical Regulations, dissemination of the revised Technical Regulations and the Guidelines, and compliance of the power operators can ensure sustainability of the intended effects and benefits of the Project. Therefore, it is expected that the Project may be satisfactory at the end of the Project.

## **4. Recommendations and Lessons Learned**

### **4-1. Recommendations**

#### **For the Project**

##### **1) Revision of PDM Ver.2 to specify verifiable indicators for the Overall Goal**

As mentioned above, it is necessary to set specific and practical indicators to verify the Overall Goal at a time of ex-post evaluation, which will be conducted by JICA within 2-4 years after the project completion. The indicators can be useful for MOIT and MOC to assess effects of the revised Technical Regulations and the Guidelines. Considering difficulty of quantitative information collection, the indicators should be based on qualitative data. Quantification of qualitative data is preferable to ensure objectivity of verification.

#### **For the Vietnamese Side**

##### **1) Promulgation of the Technical Regulations**

In order to ensure effectiveness and sustainability of the Project, promulgation of the revised Technical Regulations by MOIT and MOC is essential. MOIT and MOC need to complete necessary procedures and process for promulgation according to the target schedule.

##### **2) Activities for Dissemination of the Guidelines**

Since it is a key issue to make project owners and power operators to apply the revised Technical Regulations without any troubles, effective dissemination measures should be taken by MOIT and MOC. As mentioned above, the Technical Guidelines can be useful reference how to comply the revised Technical Regulations on site of power facilities. Therefore, it is required for the Vietnamese side to conduct refining works of the drafted Technical Guidelines prepared by the JICA expert team in order to increase their usability. Also, more detail explanations and advices through workshops or trainings can help and facilitate project owners and power operators use the Guidelines effectively in order to apply the Technical Regulations. Elaboration of supplemental reference, such as explanatory notes on the Technical Regulations and the Guidelines, also may be a useful device of dissemination. Also, in order to increase usability and usefulness of the Guidelines, the timely revisions based on feedbacks from the users are essential.

##### **3) Monitoring of Compliance of the Technical Regulations**

It is recommended to enhance the institutional arrangement for monitoring compliance of the Technical Regulations.

In terms of the power facilities managed by EVN, it is recommended that EVN is responsible to monitor compliance of the Technical Regulations by their subsidiaries and facilities. For the facilities constructed and operated by other project owners or operators, MOIT or MOC needs to directly check them. It can be based on the existing reporting system for large-scale projects and

power operators. For effective utilization of data and information to be collected by the reporting system, it is necessary to establish a system to compile and classify data and information collected in order to analyze the situation, such as the number of cases of violation within the total number of the power operators.

A feedback system or regular meeting with project owners and power operators on applications of the Technical Regulations and utilization of the Technical Guidelines can be useful for future update and revision of the Technical Regulations and the Technical Guidelines. In particular, in terms of thermal power plants, information sharing and exchanges with project owners and operators since various operators, including Independent Power Producers (IPPs), have been participating thermal power generations other than EVN are essential.

#### **4-2. Lessons Learned**

##### **Necessity of Ownership-Based Approach to by Technical Cooperation for Legal System, including Technical Regulations**

In the case that the target country has sufficient human resources with appropriate technical level, it is essential to mobilize and utilize capable local human resources in order to implement a project effectively. Also, in a country such as Vietnam, legal documents are required to be elaborated in their official language. While it is difficult for JICA to assign Japanese expert with sufficient ability of Vietnamese to elaborate legal documents, local experts do not have technical knowledge and experiences to introduce new technologies and system. In that case, it is preferable for JICA experts to play an advisory role from technical aspect.

For example, at the first stage, the JICA expert team may need to support establish framework of legislation or regulations to be newly developed or to be reformed. Also, joint works of the JICA expert team and a local expert team is essential to identify and understand key issues to be addressed. However, at the second stage, the major works, such as drafting, reviewing and refining of laws or regulations, should be taken by the local expert team while the JICA expert team should give necessary and useful technical advices to practically apply legislation or regulations on site.

More effective mobilization of local human resource can enable maximize effectiveness of technical cooperation project and sustainability of their benefits through better technical transfer and enhanced ownership of counterpart side.

(END)

## Project Design Matrix (PDM) Version 1

### PDM: Electric Power Technical Standards Promotion Project in Vietnam

Duration: 3 Years (*March in 2010 to January in 2013*)

Implementation Institutions: Ministry of Industry and Trade, Ministry of Construction, Vietnam Electricity (and other concerned institutions)

Target Area: The Whole Vietnam

Direct Target Group: Working Groups

In-direct Target Group: Electric Power Industry in Vietnam

| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification  | Important Assumptions  |
|---|---|--|--|
| <p><b>Overall Goal:</b><br/>Improve reliability and safety of power supply by means of decreasing electric power disorders caused by failures in design, construction, operation and maintenance through disseminating Technical Standards to electric power industry in Vietnam.</p> | <p>1. Numbers of occurrence in failure and power outage of electric power supply are decreased.</p>   | <p>1. MOIT/EVN/MOC failure report</p>  |  |
| <p><b>Project Purpose:</b><br/>Electric power Technical Standards will be enacted and operated effectively and efficiently through disseminating Technical Standards and Guidelines to electric power industry in Vietnam.</p>  | <p>1. Numbers of Technical Standards and Guidelines approved as ministerial circulars or codes<br/>2. Numbers of participants/participating companies to workshop for dissemination<br/>3. Degree of satisfaction to Technical Standards and Guidelines by technical staff in electric power industry</p>                                   | <p>1. Ministerial circular notice/Gazette<br/>2. Project record<br/>3. Questionnaire survey</p>                      | <ul style="list-style-type: none"> <li>• Government policy on the electric power Technical Standards will not be changed drastically.</li> </ul>   |
| <p><b>Outputs:</b><br/>1. Report of review on existing Technical Standards will be developed.<br/>2. Technical Standards will be revised and developed.<br/>3. Guidelines for Technical Standards will be developed.</p>  | <p>1. The report is approved by JMCs<br/>2.1 Technical Standards are timely approved by JMCs<br/>2.2 Technical Standards include contents required by the Vietnamese side.<br/>3.1 Guidelines for Technical Standards are approved by JMCs<br/>3.2 Guidelines for Technical Standards include contents required by the Vietnamese side.</p> | <p>1. Project record<br/>2.1 Project record<br/>2.2 Project record<br/>3.1 Project record<br/>3.2 Project record</p> | <ul style="list-style-type: none"> <li>• Technical Standards are enacted as ministerial circulars or codes as planned.</li> <li>• Appropriate budget of the Vietnamese side for disseminating Technical Standards is secured.</li> </ul> |

| Narrative Summary  | Objectively Verifiable Indicators  | Means of Verification   | Important Assumptions  |
|--|--|---|--|
| <p><b>Activities:</b></p> <p>1.1 Collect existing Technical Standards, related documents and information</p> <p>1.2 Review existing Technical Standards and related documents</p> <p>1.3 Develop the report of review on inconsistency of existing Technical Standards and the resultant problems, and the necessities for improvement</p> <p>2.1 Develop new Technical Standards by Working Groups (“WGs”)</p> <ul style="list-style-type: none"> <li>• <u>WG: Hydro 2</u> (Under MOC): Design, Construction, Completion Inspection</li> <li>• <u>WG: Thermal</u> (Under MOIT): Design for Large-scaled Coal-fired Plant &amp; Gas-combined Cycle</li> </ul> <p>2.2 Make revision and addition into the existing Technical Standards by WGs</p> <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT): Vol. 5 &amp; 6</li> <li>• <u>WG: Thermal</u> (Under MOIT): Vol. 5 &amp; 6</li> <li>• <u>WG: Network</u> (Under MOIT): Vol. 1-7 (including Grounding &amp; Lightening Protection)</li> </ul> <p>3.1 Prepare framework of Guidelines based on revised and developed Technical Standards by WGs</p> <p>3.2 Develop Guidelines by WGs</p> <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT)</li> <li>• <u>WG: Hydro 2</u> (Under MOC)</li> <li>• <u>WG: Thermal</u> (Under MOIT)</li> <li>• <u>WG: Network</u> (Under MOIT)</li> </ul> | <p style="text-align: center;"><u>Inputs: Vietnamese Side</u></p> <p>&lt;Personnel Inputs &gt;</p> <ul style="list-style-type: none"> <li>• Joint Management Committee</li> <li>• Technical Working Groups               <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT)                   <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) MOC Expert X 1 person</li> <li>3) MOST Expert X 1 Person</li> <li>4) EVN Science, Technology &amp; Environment X 1 person</li> <li>5) EVN Productive Technical Engineer X 1 person</li> </ol> </li> <li>• <u>WG: Hydro 2</u> (Under MOC)                   <ol style="list-style-type: none"> <li>1) MOC Expert X 1-2 persons</li> <li>2) MOIT Expert X 1 person</li> <li>3) MOST Expert X 1 Person</li> <li>4) EVN Science, Technology &amp; Environment X 1 person</li> <li>5) EVN Design Engineer X 1 person</li> <li>6) MARD (HQ) X 1 person</li> </ol> </li> <li>• <u>WG: Thermal</u> (Under MOIT)                   <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) MOST Expert X 1 Person</li> <li>3) EVN Productive Technical Engineer X 1-2 persons</li> <li>4) Power Plant Productive Technical Engineer (in principle from Plant) X 1 person</li> </ol> </li> <li>• <u>WG: Network</u> (Under MOIT):                   <ol style="list-style-type: none"> <li>1) MOIT Expert X 3 persons</li> <li>2) MOST Expert X 1 Person</li> <li>3) EVN Science, Technology &amp; Environment X 1 person</li> <li>4) EVN Productive Technical Engineer X 1 person</li> </ol> </li> </ul> </li> </ul> <p>&lt;Building &amp; Facilities&gt;</p> <ul style="list-style-type: none"> <li>• Project Office Space for Japanese Experts</li> </ul> <p>&lt;Administration Cost &gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for hiring consultants supporting JICA Experts</li> <li>• Necessary cost for activities of WG Members (from MOIT &amp; MOC respectively)</li> </ul> | <p style="text-align: center;"><u>Inputs: Japanese Side</u></p> <p>&lt;Dispatch of Experts&gt;</p> <p>&lt;Long-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Chief Advisor</li> </ul> <p>&lt;Short-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Hydro (civil engineering, electrical)</li> <li>• Thermal (mechanical, electrical)</li> <li>• Network (transmission, substation, distribution)</li> </ul> <p>&lt;Technical Training in Japan&gt;</p> <p>&lt; Workshops&gt;</p> <p>&lt;Cost&gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for hiring consultants supporting JICA experts</li> </ul> <p>&lt; Machinery and Equipment&gt;</p> <ul style="list-style-type: none"> <li>• Other machinery such as vehicles and equipment to be agreed mutually upon as necessary for the implementation of the Project</li> </ul> | <ul style="list-style-type: none"> <li>• WGs and JMCs smoothly function as expected.</li> </ul> <hr/> <p><b><u>Pre-conditions:</u></b></p> <ul style="list-style-type: none"> <li>• Project Purpose and necessary commitment for the Inputs are understood and secured.</li> </ul> |

Abbreviation:

WG: Working Groups, JMC: Joint Management Committee

## Project Design Matrix (PDM) Version 2

**Project Title: Electric Power Technical Standards Promotion Project in Vietnam**

Executing Agencies: Ministry of Industry and Trade (MOIT), Ministry of Construction (MOC), Vietnam Electricity (EVN), (and other organizations concerned)

Target Area: Vietnam

Target Group: Electric power industries in Vietnam

Project Period: Three Years from March, 2010 to June 2013

Version Number: PDM Ver. 2

Date: May 16, 2012

| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification  | Important Assumptions  |
|---|---|--|--|
| <p><b>Overall Goal:</b><br/>The Electric Power Technical Standards and Guidelines shall be enforced to ensure improvement of reliability and safety of power supply in Vietnam.</p> | <p>(Details will be specified in the terminal evaluation.)</p> <ol style="list-style-type: none"> <li>1. The Electric Power Technical Standards and Guidelines under MOIT are promulgated by the end of 2014.</li> <li>2. The Technical Guidelines concerning civil works of hydropower plants under MOC is promulgated by the end of 2014.</li> <li>3. Designs of newly constructed electric power facilities are permitted according to the Electric Power Technical Standards and Guidelines.</li> <li>4. Completion inspections of newly constructed electric power facilities are conducted according to the Electric Power Technical Standards and Guidelines.</li> <li>5. Regular inspections on operation and maintenance of electric power facilities are conducted and reported by operators to MOIT according to the Electric Power Technical Standards and Guidelines.</li> </ol> | <p>(Details will be specified in the terminal evaluation.)</p> <ol style="list-style-type: none"> <li>1. Documents of MOIT</li> <li>2. Documents of MOC</li> </ol>                               |  |
| <p><b>Project Purpose:</b><br/>The Electric Power Technical Standards and Guideline are authorized by the Vietnamese authorities.</p>   | <ol style="list-style-type: none"> <li>1. The final draft of the Electric Power Technical Standards in the scope of MOIT is approved by JMC by June 2013.</li> <li>2. The final draft of the Electric Power Technical Guidelines in the scope of MOIT is approved by JMC by June 2013.</li> <li>3. The Technical Standards concerning civil works of hydropower plants in the scope of MOC is promulgated by the end of 2012.</li> <li>4. The final draft of Technical Guidelines concerning civil works of hydropower plants in the scope of MOC is approved by JMC by June 2013.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Minutes of Meeting on JMC</li> <li>2. Minutes of Meeting on JMC</li> <li>3. Official documents of MOC</li> <li>4. Minutes of Meeting on JMC</li> </ol> | <p>Government policy concerning the Electric Power Technical Regulations will be remained.</p> |

| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification   | Important Assumptions   |
|---|---|---|---|
| <p><b>Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Report of review on existing Technical Standards is developed.</li> <li>2. Drafts of the Technical Standards are developed.</li> <li>3. Drafts of the Guidelines for Technical Standards are developed.</li> </ol>   | <ol style="list-style-type: none"> <li>1. The report is approved by JMCs by July, 2010.</li> <li>2.1. The final drafts of the Electric Power Technical Standards in English are submitted to JMC by August, 2011.</li> <li>2.2 The final draft of the Technical Standards of the MOIT scope in Vietnamese is refined by the MOIT expert team by May, 2013.</li> <li>2.3 The final draft of the Technical Standards of the MOC scope in Vietnamese is refined by the MOC expert team by June, 2012.</li> <li>3.1 The final drafts of the Electric Power Technical Guidelines are submitted to JMC by May, 2013.</li> <li>3.2 The final draft of the Technical Guidelines of the MOIT scope is refined by the MOIT expert team by the end of May, 2013.</li> <li>3.3 The final draft of the Technical Guidelines of the MOC scope is refined by the MOC expert team by the end of May, 2013.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Minutes of meeting on JMC</li> <li>2.1 Project record</li> <li>2.2 Project record</li> <li>3.1 Project record</li> <li>3.2 Project record</li> </ol>  |   |
| <p><b>Activities:</b></p> <ol style="list-style-type: none"> <li>1.1 Collect existing Technical Standards, related documents and information</li> <li>1.2 Review existing Technical Standards and related documents</li> <li>1.3 Develop the report of review on inconsistency of existing Technical Standards and the resultant problems, and the necessities for improvement</li> <li>2.1 Develop new Technical Standards by Working Groups (“WGs”) <ul style="list-style-type: none"> <li>• <u>WG: Hydro 2</u> (Under MOC): Design, Construction, Completion Inspection for hydropower civil works</li> <li>• <u>WG: Thermal</u> (Under MOIT): Design for Large-scaled Coal-fired Plant &amp; Gas-combined Cycle</li> </ul> </li> <li>2.2 Make revision and addition into the existing Technical Standards by WGs <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT): Vol. 5 &amp; 6</li> <li>• <u>WG: Thermal</u> (Under MOIT): Vol. 5 &amp; 6</li> <li>• <u>WG: Network</u> (Under MOIT): Vol. 1-7 (including Grounding &amp; Lightening Protection)</li> </ul> </li> <li>2.3 Review the final drafts of Technical Standards in English and Vietnamese comprehensively</li> <li>3.1 Prepare framework of Guidelines based on revised and developed Technical Standards by WGs</li> <li>3.2 Develop Guidelines by WGs <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT)</li> <li>• <u>WG: Hydro 2</u> (Under MOC)</li> </ul> </li> </ol> | <p style="text-align: center;"><b>Inputs: Vietnamese Side</b></p> <p>&lt;Personnel Inputs &gt;</p> <ul style="list-style-type: none"> <li>• Joint Management Committee</li> <li>• Technical Working Groups <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT) <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) MOC Expert X 1 person</li> <li>3) EVN Science, Technology &amp; Environment X 1 person</li> <li>4) EVN Productive Technical Engineer X 1 person</li> </ol> </li> <li>• <u>WG: Hydro 2</u> (Under MOC) <ol style="list-style-type: none"> <li>1) MOC Expert X 1-2 persons</li> <li>2) MOIT Expert X 1 person</li> <li>3) EVN Science, Technology &amp; Environment X 1 person</li> <li>4) EVN Design Engineer X 1 person</li> <li>5) MARD (HQ) X 1 person</li> </ol> </li> <li>• <u>WG: Thermal</u> (Under MOIT) <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) EVN Productive Technical Engineer X 1-2 persons</li> <li>3) Power Plant Productive Technical Engineer (in principle from Plant) X 1 person</li> </ol> </li> </ul> </li> </ul> | <p style="text-align: center;"><b>Inputs: Japanese Side</b></p> <p>&lt;Dispatch of Experts&gt;</p> <p>&lt;Long-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Chief Advisor</li> </ul> <p>&lt;Short-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Hydro (civil engineering, electrical)</li> <li>• Thermal (mechanical, electrical)</li> <li>• Network (transmission, substation, distribution)</li> </ul> <p>&lt;Technical Training in Japan&gt;</p> <p>&lt; Workshops&gt;</p> <p>&lt;Cost&gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for hiring consultants supporting JICA experts</li> </ul> <p>&lt; Machinery and Equipment&gt;</p> <ul style="list-style-type: none"> <li>• Other machinery such as vehicles and equipment to be agreed mutually upon as necessary for the implementation of the Project</li> </ul> | <p style="text-align: center;"><b>Pre-conditions:</b></p> <ul style="list-style-type: none"> <li>• Project Purpose and necessary commitment for the Inputs are understood and secured.</li> </ul> |



| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification | Important Assumptions |
|---|---|-----------------------|-----------------------|
| <ul style="list-style-type: none"> <li>• <u>WG: Thermal</u> (Under MOIT)</li> <li>• <u>WG: Network</u> (Under MOIT)</li> </ul> <p>3.3 Review the drafts of Technical Guidelines in English and Vietnamese comprehensively</p> | <ul style="list-style-type: none"> <li>• <u>WG: Network</u> (Under MOIT):               <ol style="list-style-type: none"> <li>1) MOIT Expert X 3 persons</li> <li>2) EVN Science, Technology &amp; Environment X 1 person</li> <li>3) EVN Productive Technical Engineer X 1 person</li> </ol> </li> <li>• Expert team (MOIT)</li> <li>• Expert team (MOC)</li> </ul> <p>&lt;Building &amp; Facilities&gt;</p> <ul style="list-style-type: none"> <li>• Project Office Space for Japanese Experts</li> </ul> <p>&lt;Administration Cost &gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for activities of WG Members (from MOIT &amp; MOC respectively)</li> </ul> |                       |                       |

Abbreviation: WG: Working Groups, JMC: Joint Management Committee

## Project Design Matrix (PDM) Version 3

**Project Title: Electric Power Technical Standards Promotion Project in Vietnam**

Executing Agencies: Ministry of Industry and Trade (MOIT), Ministry of Construction (MOC), Vietnam Electricity (EVN), (and other organizations concerned)

Target Area: Vietnam

Target Group: Electric power industries in Vietnam

Project Period: Three Years from March, 2010 to June 2013

Version Number: PDM Ver. 3

Date: April 24, 2013

| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification   | Important Assumptions   |
|---|---|---|---|
| <p><b>Overall Goal:</b><br/>The Electric Power Technical Regulations and Guidelines shall be enforced to ensure improvement of reliability and safety of power supply in Vietnam.</p> | <ol style="list-style-type: none"> <li>1. The Electric Power Technical Regulations under MOIT are promulgated by the end of 2014.</li> <li>2. The Electric Power Technical Guidelines under MOIT are disseminated through website, workshops, distribution of booklets, etc. by the end of 2014.</li> <li>3. The Technical Guidelines concerning civil works of hydropower plants under MOC are disseminated through website, workshops, distribution of booklets, etc. by the end of 2014.</li> <li>4. Compliance of the Technical Regulations and utilization of the Technical Guidelines are checked by the following points:               <ul style="list-style-type: none"> <li>- No. of approved large-scale project after the promulgation of the Technical Regulations)</li> <li>- No. of completion inspection reports to a committee concerned and No of order for improvement.</li> <li>- Internal operational regulations according to the Technical Regulations prepared by facilities owned by EVN and other operators.</li> </ul> </li> </ol> | <p>The indicators can be verified by the following means:</p> <ol style="list-style-type: none"> <li>1. Documents and records of MOIT</li> <li>2. Documents and records of MOC</li> <li>3. Internal regulations of EVN and their subsidiaries, other operators</li> <li>4. Questionnaire survey to EVN and their subsidiaries, other operators</li> <li>5. Sample site visits of power facilities owned by EVN and other operators</li> </ol> |   |
| <p><b>Project Purpose:</b><br/>The Electric Power Technical Regulations and Guideline are authorized by the Vietnamese authorities.</p>   | <ol style="list-style-type: none"> <li>1. The final draft of the Electric Power Technical Regulations in the scope of MOIT is approved by JMC by June 2013.</li> <li>2. The final draft of the Electric Power Technical Guidelines in the scope of MOIT is approved by JMC by June 2013.</li> <li>3. The Technical Regulations concerning civil works of hydropower plants in the scope of MOC is promulgated by the end of 2012.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Minutes of Meeting on JMC</li> <li>2. Minutes of Meeting on JMC</li> <li>3. Official documents of MOC</li> <li>4. Minutes of Meeting on JMC</li> </ol>  | <ul style="list-style-type: none"> <li>• Government policy concerning the Electric Power Technical Regulations will be remained.</li> </ul> |

| Narrative Summary   | Objectively Verifiable Indicators   | Means of Verification  | Important Assumptions                                     |
|---|---|--|---|
|   | <p>4. The final draft of Technical Guidelines concerning civil works of hydropower plants in the scope of MOC is approved by JMC by June 2013.</p>  |  |   |
| <p><b>Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Report of review on existing Technical Regulations is developed.</li> <li>2. Drafts of the Technical Regulations are developed.</li> <li>3. Drafts of the Guidelines for Technical Regulations are developed.</li> </ol>   | <ol style="list-style-type: none"> <li>1. The report is approved by JMCs by July, 2010.</li> <li>2.1. The final drafts of the Electric Power Technical Regulations in English are submitted to JMC by August, 2011.</li> <li>2.2 The final draft of the Technical Regulations of the MOIT scope in Vietnamese is refined by the MOIT expert team by May, 2013.</li> <li>2.3 The final draft of the Technical Regulations of the MOC scope in Vietnamese is refined by the MOC expert team by June, 2012.</li> <li>3.1 The final drafts of the Electric Power Technical Guidelines are submitted to JMC by May, 2013.</li> <li>3.2 The final draft of the Technical Guidelines of the MOIT scope is refined by the MOIT expert team by the end of May, 2013.</li> <li>3.3 The final draft of the Technical Guidelines of the MOC scope is refined by the MOC expert team by the end of May, 2013.</li> </ol> | <ol style="list-style-type: none"> <li>1. Minutes of meeting on JMC</li> <li>2.1 Project record</li> <li>2.2 Project record</li> <li>3.1 Project record</li> <li>3.2 Project record</li> </ol>   |   |
| <p><b>Activities:</b></p> <ol style="list-style-type: none"> <li>1.1 Collect existing Technical Regulations, related documents and information</li> <li>1.2 Review existing Technical Regulations and related documents</li> <li>1.3 Develop the report of review on inconsistency of existing Technical Regulations and the resultant problems, and the necessities for improvement</li> <li>2.1 Develop new Technical Regulations by Working Groups ("WGs") <ul style="list-style-type: none"> <li>• <u>WG: Hydro 2</u> (Under MOC): Design, Construction, Completion Inspection for hydropower civil works</li> <li>• <u>WG: Thermal</u> (Under MOIT): Design for Large-scaled Coal-fired Plant &amp; Gas-combined Cycle</li> </ul> </li> <li>2.2 Make revision and addition into the existing Technical Regulations by WGs <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT): Vol. 5 &amp; 6</li> <li>• <u>WG: Thermal</u> (Under MOIT): Vol. 5 &amp; 6</li> </ul> </li> </ol> | <p style="text-align: center;"><b>Inputs: Vietnamese Side</b></p> <p>&lt;Personnel Inputs &gt;</p> <ul style="list-style-type: none"> <li>• Joint Management Committee</li> <li>• Technical Working Groups <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT) <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) MOC Expert X 1 person</li> <li>3) EVN Science, Technology &amp; Environment X 1 person</li> <li>4) EVN Productive Technical Engineer X 1 person</li> </ol> </li> <li>• <u>WG: Hydro 2</u> (Under MOC) <ol style="list-style-type: none"> <li>1) MOC Expert X 1-2 persons</li> <li>2) MOIT Expert X 1 person</li> <li>3) EVN Science, Technology &amp;</li> </ol> </li> </ul> </li> </ul>  | <p style="text-align: center;"><b>Inputs: Japanese Side</b></p> <p>&lt;Dispatch of Experts&gt;</p> <p>&lt;Long-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Chief Advisor</li> </ul> <p>&lt;Short-term Expert&gt;</p> <ul style="list-style-type: none"> <li>• Hydro (civil engineering, electrical)</li> <li>• Thermal (mechanical, electrical)</li> <li>• Network (transmission, substation, distribution)</li> </ul> <p>&lt;Technical Training in Japan&gt;</p> <p>&lt; Workshops&gt;</p> | <p style="text-align: center;"><b>Pre-conditions:</b></p> |

| Narrative Summary   | Objectively Verifiable Indicators  | Means of Verification   | Important Assumptions   |
|---|--|---|---|
| <ul style="list-style-type: none"> <li>• <u>WG: Network</u> (Under MOIT): Vol. 1-7 (including Grounding &amp; Lightning Protection)</li> </ul> <p>2.3 Review the final drafts of Technical Regulations in English and Vietnamese comprehensively</p> <p>3.1 Prepare framework of Guidelines based on revised and developed Technical Regulations by WGs</p> <p>3.2 Develop Guidelines by WGs</p> <ul style="list-style-type: none"> <li>• <u>WG: Hydro 1</u> (Under MOIT)</li> <li>• <u>WG: Hydro 2</u> (Under MOC)</li> <li>• <u>WG: Thermal</u> (Under MOIT)</li> <li>• <u>WG: Network</u> (Under MOIT)</li> </ul> <p>3.3 Review the drafts of Technical Guidelines in English and Vietnamese comprehensively</p> | <p>Environment X 1 person</p> <p>4) EVN Design Engineer X 1 person</p> <p>5) MARD (HQ) X 1 person</p> <ul style="list-style-type: none"> <li>• <u>WG: Thermal</u> (Under MOIT)               <ol style="list-style-type: none"> <li>1) MOIT Expert X 1-2 persons</li> <li>2) EVN Productive Technical Engineer X 1-2 persons</li> <li>3) Power Plant Productive Technical Engineer (in principle from Plant) X 1 person</li> </ol> </li> <li>• <u>WG: Network</u> (Under MOIT):               <ol style="list-style-type: none"> <li>1) MOIT Expert X 3 persons</li> <li>2) EVN Science, Technology &amp; Environment X 1 person</li> <li>3) EVN Productive Technical Engineer X 1 person</li> </ol> </li> </ul> <ul style="list-style-type: none"> <li>• Expert team (MOIT)</li> <li>• Expert team (MOC)</li> </ul> <p>&lt;Building &amp; Facilities&gt;</p> <ul style="list-style-type: none"> <li>• Project Office Space for Japanese Experts</li> </ul> <p>&lt;Administration Cost &gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for activities of WG Members (from MOIT &amp; MOC respectively)</li> </ul> | <p>&lt;Cost&gt;</p> <ul style="list-style-type: none"> <li>• Necessary cost for hiring consultants supporting JICA experts</li> </ul> <p>&lt;Machinery and Equipment&gt;</p> <ul style="list-style-type: none"> <li>• Other machinery such as vehicles and equipment to be agreed mutually upon as necessary for the implementation of the Project</li> </ul> | <ul style="list-style-type: none"> <li>• Project Purpose and necessary commitment for the Inputs are understood and secured.</li> <li>• Other machinery such as vehicles and equipment to be agreed mutually upon as necessary for the implementation of the Project</li> </ul> |

Abbreviation: WG: Working Groups, JMC: Joint Management Committee

Appendix IV  
Inputs by the Japanese Side: Dispatch of Japanese Experts

| Name         | Assignment | Period<br>(Long-term)                              | Office affiliated                              | 1st ST MM | 2nd ST MM | Total MM |
|--------------|------------|--|--|-----------|-----------|----------|
| SHIGERU      | NAKAMURA   | Team Leader / Hydropower Expert A                  | Electric Power Development Co., Ltd. (J-Power) | 10.90     | 14.77     | 25.67    |
| [Short-term] |            |  |  |           |           |          |
| YUTARO       | MIZUHASHI  | Hydropower Expert B<br>(Civil Works)               | Electric Power Development Co., Ltd. (J-Power) | 3.00      | 2.83      | 5.83     |
| SHUJI        | UMESAKI    | Hydropower Expert C<br>(Hydromechanical Equipment) | Electric Power Development Co., Ltd. (J-Power) | 2.23      | 2.00      | 4.23     |
| MOTOTARO     | OKADA      | Hydropower Expert D<br>(Electrical Works)          | Electric Power Development Co., Ltd. (J-Power) | 2.57      | 2.50      | 5.07     |
| YOSHIO       | OOYAMA     | Thermal Power Expert A<br>(Mechanical Equipment A) | West Japan Engineering Consultants, Inc.       | 3.80      | 3.33      | 7.13     |
| HIROAHI      | IMAMURA    | Thermal Power Expert B<br>(Electrical Works A)     | West Japan Engineering Consultants, Inc.       | 3.10      | 1.53      | 4.63     |
| MASAAKI      | KOGA       | Thermal Power Expert C<br>(Mechanical Equipment B) | West Japan Engineering Consultants, Inc.       | 3.00      | 3.33      | 6.33     |

|                                |                           |  |  |   |       |       |       |
|--------------------------------|---------------------------|--|--|---|-------|-------|-------|
| TAKASHI                        | EGASHIRA                  | Thermal Power Expert D<br>(Electrical Works B) | (1st Stage)<br>-<br>(2nd Stage)<br>12.5.9-12.5.22<br>12.8.29-12.9.7  | West Japan Engineering<br>Consultants, Inc. | 0.00  | 0.60  | 0.60  |
| KENICHI                        | KUWAHARA                  | Network Expert A<br>(Transmission System)      | (1st Stage)<br>10.3.13-3.21<br>10.6.21-7.29<br>10.10.7-10.30<br>11.2.22-3.17<br>11.6.20-7.7<br>(2nd Stage)<br>11.11.8-11.19<br>12.4.23-12.4.28<br>12.5.8-12.5.19<br>12.7.23-12.8.5<br>12.10.21-12.11.3<br>13.4.17-13.4.27<br>13.6.2-13.6.8 | Shikoku Electric Power Co., Inc.            | 3.80  | 2.53  | 6.33  |
| TOSHIO                         | AKI                       | Network Expert B<br>(Substation System)        | (1st Stage)<br>10.3.14-3.21<br>10.6.20-7.29<br>10.10.10-11.2<br>11.3.8-3.16<br>11.5.4-11.5.18<br>11.6.19-7.6<br>(2nd Stage)<br>11.11.21-12.3<br>12.2.5-12.2.8<br>12.7.8-7.21<br>12.7.29-12.8.11<br>12.10.21-12.11.3<br>13.1.13-13.1.26     | Shikoku Electric Power Co., Inc.            | 3.80  | 2.43  | 6.23  |
| YOSHITETSU                     | FUJISAWA                  | Network Expert C<br>(Distribution System)      | (1st Stage)<br>10.6.21-7.3<br>10.10.7-10.30<br>(2nd Stage)<br>-  | Shikoku Electric Power Co., Inc.            | 1.23  | 0.00  | 1.23  |
| TSUGUHIRO                      | YAMADA                    | Network Expert C<br>(Distribution System)      | (1st Stage)<br>11.5.4-5.17<br>11.6.19-7.6<br>(2nd Stage)<br>11.11.8-11.12<br>12.5.8-12.5.19<br>12.8.26-12.9.1<br>12.10.21-12.10.31<br>13.1.13-13.1.26<br>13.4.12-13.4.27<br>13.6.2-13.6.8  | Shikoku Electric Power Co., Inc.            | 1.07  | 2.40  | 3.47  |
| TAKAYOSHI                      | MASUDA                    | Network Expert D<br>(Grounding System)         | (1st Stage)<br>10.6.20-7.13<br>10.10.10-10.21<br>11.3.3-11.3.17<br>11.6.19-7.6<br>(2nd Stage)<br>11.14-11.25<br>12.5.8-12.5.19<br>12.7.8-12.7.17<br>12.10.21-12.11.3<br>13.4.15-13.4.19  | Shikoku Electric Power Co., Inc.            | 2.30  | 1.77  | 4.07  |
| SHIGEO                         | FUJINO                    | Network Expert E<br>(Inspection)               | (1st Stage)<br>-<br>(2nd Stage)<br>12.5.8-12.5.19<br>12.8.26-12.9.1  | Shikoku Electric Power Co., Inc.            | 0.00  | 0.63  | 0.63  |
| KENICHI<br>TAKAYOSHI<br>TOSHIO | KUWAHARA<br>MASUDA<br>AKI | Network Support                                | (1st Stage)<br>-<br>(2nd Stage)<br>12.9.10-12.9.15<br>12.12.12-12.12.20<br>13.1.14-13.1.26<br>13.3.7-13.3.15<br>13.4.12-13.4.28<br>13.5.19-13.5.25   | Shikoku Electric Power Co., Inc.            | 0.00  | 2.03  | 2.03  |
| Total MM                       |                           |  |  |   | 40.80 | 42.68 | 83.68 |

**Appendix V**  
**Inputs by the Japanese Side: Trainig of CP in Japan**

| Name                     | Position   | Subject of training | Fiscal Year of Japan | Duration                        | Output (Project Component)         |
|--------------------------|--|---------------------|----------------------|---------------------------------|------------------------------------|
| Mr. Do Duc Quan          | Deputy Director General / Energy Department, MOIT (Ministry of Industry and Trade)   | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Dinh Vu Thanh        | Deputy Director General / Department of Science - Technology and Environment, MARD (Ministry of Agriculture and Rural Development) | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Phan Duy Phu         | Hydropower Expert / Energy Department, MOIT (Ministry of Industry and Trade)   | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Tran Viet Hoa        | Manager of Division / Department of Science and Technology, MOIT (Ministry of Industry and Trade)                                  | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Duong Khac Hien      | Hydropower Expert / Department of Science and Technology, MOIT (Ministry of Industry and Trade)                                    | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Pham Thanh Trung     | Officer / Legal Department, MOIT (Ministry of Industry and Trade)  | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Doan Trong Tuan      | Electrical specialist / Vietnam institute of architecture, urban and rural planning, MOC (Ministry of Construction)                | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Tran Hong Tien       | Electrical Expert / Department of Technic and Production, EVN (Viet Nam Electricity)   | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
| Mr. Nguyen Khac Tien Hai | Deputy Head / Measurement Department, ETC (Northern Electrical Testing Company)  | Hydropower          | 2010                 | 2010 November 15 to November 22 | Technical Standards and Guidelines |
|                          |  |                     |                      |                                 |                                    |
| Mr. Nguyen Van Long      | Expert / Science and Technology Department, MOIT (Ministry of Industry and Trade)  | Thermal Power       | 2010                 | 2011 March 28 to March 31       | Technical Standards and Guidelines |
| Mr. Nguyen Quoc Thuy     | Senior Expert / Science and Technology Department, MOIT (Ministry of Industry and Trade)   | Thermal Power       | 2010                 | 2011 March 28 to March 31       | Technical Standards and Guidelines |
| Ms. Vu Thi Hau           | Assistant / Science and Technology Department, MOIT (Ministry of Industry and Trade)   | Thermal Power       | 2010                 | 2011 March 28 to March 31       | Technical Standards and Guidelines |
| Mr. Vu Dinh Khiem        | Deputy Director, ETC (Northern Electrical Testing Company)   | Thermal Power       | 2010                 | 2011 March 28 to March 31       | Technical Standards and Guidelines |
| Mr. Trinh Van Yen        | Manager / Thermotechnology Department, ETC (Northern Electrical Testing Company)   | Thermal Power       | 2010                 | 2011 March 28 to March 31       | Technical Standards and Guidelines |
|                          |  |                     |                      |                                 |                                    |

|                      |  |         |      |                          |                                    |
|----------------------|--|---------|------|--------------------------|------------------------------------|
| Mr. Phuong Hoang Kim | Deputy Director General / Science and Technology Department, MOIT (Ministry of Industry and Trade)   | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Mr. Tran Huu Ha      | Deputy Director General / Department of Science, Technology and Environment, MOC (Ministry of Construction)  | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Mr. Dang Hai Dung    | Deputy Chief / Technical Standards, Metrology, Quality and Intellectual Property Division Science and Technology Department, MOIT (Ministry of Industry and Trade) | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Mr. Tran Manh Hung   | Head / Energy Economic, Demand Forecast & Demand Side Management Department, Institute of Energy under MOIT  | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Mr. Nguyen Tuan Anh  | Manager / Energy Department, Institute for Industrial Policy and Strategy under MOIT   | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Ms. Do Lan Binh      | Senior Expert / Technical Production Department, EVN (Viet Nam Electricity)  | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |
| Mr. Tran Xuan Tuan   | Manager / Electromechanic Department, ETC (Northern Electrical Testing Company)  | Network | 2011 | 2011 March 31 to April 6 | Technical Standards and Guidelines |



**Appendix VI.**  
**Inputs by the Japanese Side: Provision of Equipment**

**JFY 2009 (JPY) Hand Carried Equipment**

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

**JFY 2010 (JPY) Hand Carried Equipment**

| Date               | Item                | Unit Amount | Unit | Cost           |
|--------------------|---------------------|-------------|------|----------------|
| June 4, 2010       | EPSON LCD Projector | 117,000.00  | 1    | 117,000        |
| <b>Total (JPY)</b> |                     |             |      | <b>117,000</b> |

**JFY 2011 (JPY) Hand Carried Equipment**

| Date               | Item                | Unit Amount | Unit | Cost           |
|--------------------|---------------------|-------------|------|----------------|
| November 30, 2011  | EPSON LCD Projector | 128,000.00  | 2    | 256,000        |
| <b>Total (JPY)</b> |                     |             |      | <b>256,000</b> |

**JFY 2012 (JPY)**

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

373,000

**JFY 2009 (VND) Locally Purchased Equipment**

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (VND)</b> |      |             |      | <b>0.00</b> |

**JFY 2010 (VND) Locally Purchased Equipment**

| Date               | Item       | Unit Amount   | Unit | Cost              |
|--------------------|------------|---------------|------|-------------------|
| July 20, 2010      | Desktop PC | 42,439,000.00 | 1    | 42,439,000        |
| <b>Total (VND)</b> |            |               |      | <b>42,439,000</b> |

**JFY 2011 (VND) Locally Purchased Equipment**

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

**JFY 2012 (VND) Locally Purchased Equipment**

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (VND)</b> |      |             |      | <b>0.00</b> |

**Appendix VII Local cost borne by Japanese side**  
**Inputs by the Japanese Side: Local cost borne by the Japanese Side**

(Unit: JPY '000)

|                                | 1st Stage     | 2nd Stage     | Total         |
|--------------------------------|---------------|---------------|---------------|
| <b>General activity budget</b> |               |               |               |
| (1) General Activities         | 8,408         | 19,360        | <b>27,768</b> |
| (2) Local Consultant Contracts | 13,996        | 23,221        | <b>37,217</b> |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
| <b>計</b>                       | <b>22,404</b> | <b>42,581</b> | <b>64,985</b> |

## Appendix VIII.

## Inputs by the Vietnamese Side: Counterparts

| FULL NAME                        | ORGANIZATION   | POSITION  |
|----------------------------------|--|---|
| JCC Members                      |  |   |
| 1 Nguyen Dinh Hiep               | Science and Technology Dept.- MOIT   | Director  |
| 2 Phuong Hoang Kim               | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Director (until March 2012)   |
| 3 Phan Cong Hop                  | Science and Technology Dept.- MOIT   | Deputy Director   |
| 4 Dang Hai Dung                  | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 5 Nguyen Duy Hoa                 | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 6 Tran Huu Ha                    | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 7 Dang Hoang An                  | EVN  | Deputy Director General of EVN  |
| JMC Members                      |  |   |
| 8 Nguyen Dinh Hiep               | Science and Technology Dept.- MOIT   | Director  |
| 9 Phuong Hoang Kim               | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Director (until March 2012)   |
| 10 Phan Cong Hop                 | Science and Technology Dept.- MOIT   | Deputy Director   |
| 11 Dang Hai Dung                 | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 12 Nguyen Duy Hoa                | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 13 Tran Huu Ha                   | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 14 Dang Hoang An                 | EVN  | Deputy Director General of EVN  |
| WG Members (Hydropower Group-1)  |  |   |
| 15 Tran Viet Hoa                 | Science and Technology Dept.- MOIT   | Manager of Energy Efficiency Division   |
| 16 Duong Khắc Hiền               | Hydropower Department, General Energy Directorate- MOIT                          | Expert  |
| 17 Dinh Vu Thanh                 | Science, Technology & Environment Dept.- MARD                                    | Deputy Director   |
| 18 Khong Trung Duan              | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 19 Nguyen Tuan Anh               | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 20 Le Huu Hoang                  | Technical-Operational Dept. -EVN   | Expert  |
| 21 Tran Hong Tien                | Technical-Operational Dept. -EVN   | Expert  |
| 22 Le Kim Ngoc                   | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| WG Members (Hydropower Group-2)  |  |   |
| 23 Tran Huu Ha                   | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 24 Hoang Quang Nhu               | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 25 Nguyen Cong Thinh             | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 26 Dinh Chinh Loi                | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 27 Doan Trong Tuan               | Vietnam Institute of Architecture, Urban and Rural Planning                      | Staff   |
| 28 Tran Viet Hoa                 | Science and Technology Dept.- MOIT   | Manager of Energy Efficiency Division   |
| 29 Duong Khắc Hiền               | Hydropower Department, General Energy Directorate- MOIT                          | Expert  |
| 30 Dinh Vu Thanh                 | Science, Technology & Environment Dept.- MARD                                    | Deputy Director   |
| 31 Khong Trung Duan              | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 32 Nguyen Tuan Anh               | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 33 Le Huu Hoang                  | Technical-Operational Dept. -EVN   | Expert  |
| 34 Tran Hong Tien                | Technical-Operational Dept. -EVN   | Expert  |
| 35 Le Kim Ngoc                   | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| WG Members (Thermal Power Group) |  |   |
| 36 Nguyen Van Long               | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Expert  |
| 37 Tran Hong Tien                | Technical-Operational Dept. -EVN   | Expert  |
| 38 Vu Ta Thong                   | Technical-Operational Dept. -EVN   | Expert  |
| WG Members (Network Group)       |  |   |
| 39 Dang Hai Dung                 | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 40 Nguyen Duy Hoa                | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 41 Cu Huy Quang                  | Science and Technology Dept.- MOIT   | Expert / Project Coordinator (until March 2012)   |
| 42 Le Viet Cuong                 | Science and Technology Dept.- MOIT   | Expert / Project Coordinator  |
| 43 Cao Van Dung                  | Safe Technique and Industry Environment Dept.-MOIT                               | Expert  |
| 44 Trinh Kim Hung                | Expert hired by MOIT   | Retired   |
| 45 Nguyen Sy Be                  | Expert hired by MOIT   | Retired   |
| 46 Nguyen Quang Viet             | Science, Technology & Environment Dept. -EVN                                     | Deputy Director   |
| 47 Nguyen Xuan Khiem             | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| 48 Nguyen Trung Kien             | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| 49 Do Lan Binh                   | Technical-Operational Dept. -EVN   | Expert  |
| 50 Tran Nam Trung                | Technical-Operational Dept. -EVN   | Expert  |
| 51 Ho Viet Thong                 | Hanoi Power Corporation (EVN Hanoi)  | Deputy Director of Technical Dept.  |
| 52 Cao Chan                      | VINACONSULT  | Chairman of Management Board (until August 2012)  |
| 53 Tran Vinh Tinh                | Da Nang Technology University  | Head of Power system Faculty  |
| 54 Nguyen Tuan Anh               | Strategy Institute   | Expert of Energy Division   |

## Minutes of Joint WG Meeting

|  |             |  |
|--|-------------|--|
| Date and Time :  |             | 05/June/2013 8:42~10:00  |
| Vietnamese Counterpart :   |             | MOIT (Ministry of Industry and Trade)<br>MOC (Ministry of Construction)<br>EVN (Electricity Vietnam )<br>ETC (Electric Testing Center)<br>CRA (Center for Water Resource Engineering Application)<br>VINACONSUL                        |
| Venue :  |             | Main conference room (2F) at MOIT  |
| Participants:  | MOIT        | Mr. Hoa, Mr. Cuong and others  |
|  | MOC         | Mr. Duong  |
|  | EVN         | Mr. Viet , Mr. Tien and others   |
|  | JICA        | Mr. Kubo and Ms. Quynh Anh (JICA Vietnam)<br>Mr. Nakamura (Project Leader)<br>Mr. Okada, Mr. Fruyama (Hydro)<br>Mr. Kuwahara, Mr. Yamada (Network)<br>Mr. Koga, Mr. Higo (Thermal)<br>Ms. Hai (Local Coordinator), Interpreter: Ms. Ha |
|  | ETC1        | Mr. Khiem, Mr. Anh, Mr.Yen, Mr. Duc, Mr.Linh, Mr. Thanh, Mr. Truong  |
|  | CRA         | Dr. Vinh   |
|  | VINACONSULT | Dr. Cao Chan   |
|  | Contents    |  |
| <p>1. Today's agenda (Mr. Nakamura)</p> <p>(1) Report of JICA Team about Revised Final Draft Technical Regulations, etc.</p> <p>(2) Report of MOIT/MOC/EVN about the activities of each Working Group</p> <p>(3) Report of ETC about Baseline Survey</p> <p>2. Contents of discussion</p> <p>(1) Procedure and schedule for finalizing Technical Regulations (MOIT Scope)</p> <p>1) The revised Final Draft Technical Regulations were updated and submitted again in May/2013.<br/>(Mr. Nakamura)</p> <p>(2) Procedure and schedule for finalizing Technical Regulations (MOC Scope)</p> <p>1) The JICA hydropower team have continued to review Technical Regulation with CRA and PECCI and submitted Final Draft in May/2013. Although it is still pending, JICA Team will submit the final draft to JMC on 5/June to get the approval of JMC as the Project is terminated. (Mr. Nakamura)</p> <p>(3) Report of each JICA teams about Final Draft Technical Regulations</p> <p>1) The JICA hydropower team considers that the hydropower parts of Technical Regulations have substantially completed, though the further refining for formality for promulgation is required to</p> |             |  |

be done by Vietnamese side. (Mr. Nakamura)

- 2) The JICA thermal power team reflected the needs from Vietnamese side as much as possible while adhering to the basic policy to develop performance requirement type technical regulations. JICA Team hopes that Vietnamese side will finish the appropriate mandatory regulations by themselves by means of hearing comments from stakeholders widely by MOIT. (Mr. Koga)
- 3) The JICA network team considers that the submitted Technical Regulations have been completed at a satisfactory level in quality, since JICA Team reflected comments from stakeholders collected by the local consultant from last year, though the numbers of issues have been pointed out on the quality of technical terms and the consistency with the guideline until last year. (Mr. Kuwahara)

(4) Report of MOIT/MOC/EVN about the activities of Project

- 1) The review of Technical Regulations of network part have been continued in the 2<sup>nd</sup> Stage, since the drafts which were developed in the 1<sup>st</sup> Stage was not of satisfactory. The comments were collected from EVN group companies, VTA, Technical Safety Authority, PV-power, Vinacomin and four power plant construction companies. They were discussed in the WG meetings and reflected to the draft. However, some of the comments have not been reflected. Therefore, MOIT intends to proceed with reflecting the comments under the initiative of MOIT. Regarding the Technical Regulations and Guidelines of Network part, they can be promulgated as planned, since the local consultant has contributed to reviewing the technical issues and technical terms in the 2<sup>nd</sup> Stage. (MOIT Mr.Cuong)
- 2) It does not mean that it can be implemented all outcomes of the Project, though we have made the effort in order to develop good Technical Regulations. It is necessary to review and scrutinize for quality after this Project, since we have agreed to the status of Technical Regulations as legal document. Therefore, we hope further support of JICA after termination of this Project. We want to have the English version of the Technical Regulations and Guidelines of Japan to use them as a model. The workload was heavy compared to the period of the JICA Team missions and available task force of Vietnamese side. It is necessary to use guidelines carefully, since there are many units other than EVN. Therefore, it is necessary to proceed with the further revisions in cooperation with units under the initiative of MOIT. Regarding the thermal power part, which is new field to Vietnam, there were active discussions during the Project. However, the Vietnamese side intends to proceed with the further review of the draft, although it is difficult for Vietnamese side since there is a large difference in the requirements between Vietnam and Japan. Regarding the network part, the drafts are of satisfactory with good quality. Regarding the hydropower part, there is no worry about the draft since MOC has contributed to the development of draft, although it is necessary to review the part of equipment (EVN Mr.Viet)
- 3) The draft of technical regulation on hydropower civil works has been substantially completed in cooperation with JICA, MOC and the local consultant. It seems that there is no problem to reflect comments from Workshop meeting and to submit to the related ministries and agencies

for their comment, since there is no difference in the opinions collected in the two Workshops held in January and May 2013 basically. MOC intends to refine the final draft by the end of June 2013 and deliver it the related ministries for comment. MOC also intends to publish the Guideline as a document for reference. (MOC Mr. Duong)

(5) Regarding demand from Vietnamese side

- 1) JICA Team can provide the Japanese Technical Regulation for hydropower, since it is the performance requirement type. JICA Team can provide the Japanese guideline in Japanese as there is only Japanese version. However, it could not be used in Vietnam as it is, since the contents are of specific for the conditions in Japanese. (Mr. Nakamura)
- 2) It is possible to provide those for the network, since we have English version that was translated by the other project. (Mr. Kuwahara)
- 3) The contents of Technical Regulation and Guidelines have been captured into the draft Technical Regulations and Guidelines. JICA Team cannot provide English version since there is no English version. (M.Koga)

(6) Report of ETC about Baseline Survey

- 1) ETC has reported the result of following surveys and analysis.
  - Accidents and power plant outages in electrical power supply (for the years 2010 to 2012)
  - On degree of satisfaction to the existing Technical Regulations and guidelines.
  - On actual needs of existing Technical Regulations and guidelines.

EOD

**MINUTES OF MEETING**  
**ON**  
**THE EIGHTH JOINT MANAGEMENT COMMITTEE**  
**AND**  
**THE SIXTH JOINT COORDINATION COMMITTEE**  
**IN**  
**THE TECHNICAL COOPERATION PROJECT**  
**ON**  
**ELECTRIC POWER TECHNICAL STANDARDS PROMOTION IN VIETNAM**

Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the twelfth mission of the project team for the Technical Cooperation Project on Electric Power Technical Standards Promotion in Vietnam and held the eighth meeting of the Joint Management Committee (hereinafter referred to as “JMC”) and the sixth meeting of the Joint Coordination Committee (hereinafter referred to as “JCC”) with Vietnamese authorities concerned including Ministry of Industry and Trade (hereinafter referred to as “MOIT”), Ministry of Construction (hereinafter referred to as “MOC”), Ministry of Agriculture and Rural Development (hereinafter referred to as “MARD”) and Vietnam Electricity (hereinafter referred to as “EVN”) as follows:

Date and Time : June 5, 2013 10:00am-11:30am

Place : Meeting Room No 210 at MOIT

Participants: **MOIT:**

Science and Technology Dept.: Director General Mr. Nguyen Dinh Hiep, Deputy Director General Mr. Phan Cong Hop, Project Coordinator Mr. Nguyen Duy Hoa, Assistant Project Coordinator Mr. Le Viet Cuong,

General Energy Directorate: Mr. Nguyen Van Long, Mr. Duong Khac Hien

Technical Safety and Environment Dept. Mr. Cao Van Dung,

**MOC:**

Dept. of Science, Technology and Environment: Deputy Director General Dr. Tran Huu Ha, Project Coordinator Mr. Bui Van Duong,

**MARD:**

Science, Technology & Environment Dept.: Deputy Director General Mr. Dinh Vu Thanh,

**EVN:**

Science, Technology & Environment Dept.: Deputy Director/General Project Coordinator Mr. Nguyen Quang Viet, Project Coordinator Mr. Nguyen Xuan Khiem, Technical & Operational Dept. Ms. Do Lan Binh, Mr. Tran Hong Tien

**JICA Vietnam Office:**

Representative Mr. Yoshitomo Kubo, National Staff Ms. Quynh Anh,

**JICA Project Team:**

Team Leader Mr. Shigeru Nakamura,

Team Member: Mr. Yasushi Furuyama, Mr. Mototaro Okada, Mr. Masashi Higo, Mr. Masaaki Koga, Mr. Kenichi Kuwahara, Mr. Tsuguhiro Yamada,

Local Coordinator: Ms. Pham Hong Hai,

**Local Consultant:**

Northern Electrical Testing Center (ETC1): Deputy Director Mr. Vu Dinh Khiem, Project Coordinator Mr. To Tuan Anh, Mr. Ngo Thanh, Mr. Nguyen Quang Trung, Mr. Trinh Van Yen, Mr. Nguyen Xuan Truong, Mr. Nguyen Danh Duc, Mr. Nguyen Hoang Linh, The Center for Water Research and Engineering Application (CRA): Dr. Le Quang Vinh, VINACONSULT: Dr. Cao Chan

The representatives of JICA, Vietnamese authorities concerned and the JICA Project Team discussed and agreed as follows:

## Contents:

### **1. Opening Remarks**

On behalf of MOIT, Mr. Hiep introduced the participants of Vietnamese side in the 8<sup>th</sup> JMC/6<sup>th</sup> JCC Meeting and gave an opening remark expressing appreciation to the parties concerned and the outcome of the Project which would contribute to the development of Vietnam as the important legal documents and reference documents.

On behalf of MOC, Dr. Ha gave an opening remark expressing appreciation to the cooperation of JICA, MOIT and MARD in the Project. Also, Dr. Ha appreciated the draft of Technical Regulation and Guideline on Hydropower Civil Works which would contribute to the improvement of safety and quality of hydropower projects.

On behalf of JICA, Mr. Kubo gave an opening remark expressing appreciation to the efforts of all parties concerned for successful ending of the Project. In this regard, Mr. Kubo emphasized the purposes of the meeting which were approval of project output by JMC and confirmation of road map for promulgation of Technical Regulation and dissemination of Guideline expecting further effort of the Vietnamese side in the activities required after the Project.

### **2. The 8<sup>th</sup> JMC Meeting**

#### **2.1 Submission of Project Output by the JICA Project Team**

JICA Project Team submitted the following documents to JMC as the output of the Project:

- 1) Revised Final Draft Technical Regulation Vols.1 to 5 (under MOIT scope)
- 2) Final Draft Technical Regulation on Hydropower Civil Works (under MOC scope)
- 3) Final Draft Guideline Vols.1 to 5 (under MOIT scope)
- 4) Final Draft Guideline on Hydropower Civil Works (under MOC scope)
- 5) Completion Report (draft)

#### **2.2 Report of JICA Project Team about Project Completion Report**

JICA Project Team explained the outline and main points of the Project Completion Report as follows:

- The Report describes the activities performed throughout the Project period from March 2010 to June 2013.
- The Report also describes the evaluation and conclusion of the Project from the view points of lesson learned and recommendation in the project activities including the following:
  - Recommendation regarding the promulgation of Technical Regulations
  - Recommendation regarding the organizational structure after promulgation
  - Recommendation regarding the status of Guidelines and their dissemination
  - Lesson learned regarding the configuration of the WG members
  - Lesson learned regarding the mutual understanding

#### **2.3 Approval of Project Output by JMC**

On behalf of JMC, Mr. Hiep approved the draft Technical Regulations, draft Guidelines and the Project Completion Report submitted by the JICA Project Team as listed in the above 2.1.

In the above regard, Mr. Hiep stated that MOIT and MOC would proceed with procedures for promulgation of Technical Regulations and dissemination of Guidelines after finalizing the draft submitted by the JICA Project Team.



### 3. The 6<sup>th</sup> JCC Meeting

#### 3.1 Report of MOIT and MOC about promulgation and dissemination plan of Technical Regulations and Guidelines

##### (1) MOIT

MOIT reported the plan of promulgation and dissemination of Technical Regulations and Guidelines as follows:

- Science and Technology Department of MOIT will continuously take responsibility for promulgation of Technical Regulations and dissemination of Guidelines under the scope of MOIT.
- MOIT will establish the task force together with EVN and other related stakeholders for reviewing the draft and promulgation and dissemination of Technical Regulations and Guidelines by the end of 2014 at the latest.
- MOIT has the plan to promulgate the Technical Regulations and disseminate the Guidelines at the same time.
- MOIT would like to ask JICA for providing technical support as a follow-up cooperation (post-project support) to resolve remaining issues in the promulgation process.
- MOIT would like to request the JICA Project Team to provide technical support in the promulgation process.

##### (2) MOC

MOC reported the plan of promulgation and dissemination of Technical Regulations and Guidelines as follows:

- MOC plans to finalize the draft Technical Regulation on Hydropower Civil Works in June or July 2013 based on the result of Workshop held by MOC on May 31, 2013.
- Then, MOC intends to promulgate the Technical Regulation by the end of 2013 in the form of circular jointly with MOIT.
- MOC plans to finalize the draft Guideline by the experts and disseminate it by the end of 2014 as the reference documents for interpretation of stipulations in the Technical Regulation.
- MOC also would like to request the JICA Project Team to provide technical support in the promulgation process.

#### 3.2 Other Issues raised by each Party

JICA Project Team explained the current status of the draft Technical Regulations as follows:

##### (1) Overall Goal in PDM

JICA Project Team reminded MOIT and MOC about the objectively verifiable indicators for overall goal of the Project in PDM to be evaluated at the ex-post evaluation by JICA.

##### (2) Support of JICA Team after the Project

JICA side replied to MOIT and MOC about the technical support after the Project as follows:

- JICA Project Team will provide technical support as much as possible but it will be limited to a manner that the JICA Team replies to queries through communication on email basis.
- Mr. Kubo of JICA recommended MOIT and MOC that it is necessary for JICA to receive an official request to provide further technical support after the Project in the case that substantial technical support such as dispatching experts is required.

MOIT and MOC understand the reply of JICA Project Team and JICA and contact with JICA for further details if necessary.

#### 4. Closing Remarks

On behalf of MOIT, Mr. Hiep gave an closing remark expressing the appreciation to all of the parties concerned for their contribution to the Project and also expressed the commitment to the post-Project activities to be done by the Vietnamese side for improvement of electric power sector in Vietnam.



*MOIT*  
*Director General*  
*Science & Technology Dept.*  
*Mr. Nguyen Dinh Hiep*



*MOC*  
*Deputy Director General*  
*Dept. of Science, Technology*  
*& Environmental*  
*Dr. Tran Huu Ha*



*JICA Vietnam Office*  
*Representative*  
*Mr. Kubo Yoshitomo*



*JICA Project Team*  
*Leader*  
*Mr. Nakamura Shigeru*

## **Appendix-4**

### **Minutes of Working Group Meetings**

**(after Progress Report No.2)**

- 1. Hydropower Group**
- 2. Thermal Power Group**
- 3. Network Group**

## **Appendix-4.1**

### **Minutes of Working Group Meeting (Hydropower Group)**

1. Draft Minutes of 16<sup>th</sup> Working Group Meeting (Hydro Group-1) (Jul. 16, 2012)
2. Draft Minutes of 17<sup>th</sup> Working Group Meeting (Hydro Group-1) (Jul. 17, 2012)
3. Draft Minutes of 18<sup>th</sup> Working Group Meeting (Hydro Group-1) (Oct. 23, 2012)
4. Draft Minutes of 19<sup>th</sup> Working Group Meeting (Hydro Group-1) (Jan. 8, 2013)
5. Draft Minutes of 20<sup>th</sup> Working Group Meeting (Hydro Group-1) (Jan. 10, 2013)
6. Draft Minutes of 10<sup>th</sup> Working Group Meeting (Hydro Group-2) (Jan. 15, 2013)
7. Draft Minutes of 21<sup>st</sup> Working Group Meeting (Hydro Group-1) (Apr. 18, 2013)
8. Draft Minutes of MOC's Workshop on T/R & GL on Hydropower Civil Works (Jan. 17, 2013)

## 1. Draft Minutes of 16<sup>th</sup> WG Meeting (Hydropower Group-1)

|   |   |
|---|---|
| Date:   | 16th July 2012 14:00~17:20  |
| Participant   | MOIT Mr. Cuong<br>EVN (Vietnam Electricity) Mr. Tien, Mr. Hoang and Mr. Ngoc<br>ETC (Electrical Testing Center) Mr. Thanh and Mr. Trung |
| Venue   | MOIT Meeting Room No.207  |
| JICA  | Hydropower Team: Mr. Nakamura, Mr. Okada and Mr. Mizuhashi<br>Ms.Ha (Interpreter)   |
| Contents: Working Group Meeting   |   |
| <p>Discussion Contents:</p> <p>JICA Hydropower Team and the Vietnamese counterparts confirmed contents of the 1st draft of the Guideline based on the Technical Comment Table on draft Guideline.</p> <p>In the minutes, a sentence beginning from (J) and (V) means an opinion of JICA Hydropower Team and the Vietnamese counterparts, respectively.</p> <p>1. General</p> <p>Comment No.1 : Style</p> <p>(J) In general, sentences of regulations and rules use “shall”, and ordinary sentences use “must” for obedience to general rules.</p> <p>(V) The guideline shows choices and not obedience in general, so the style using “shall” and ”must ” may be misunderstood by readers, however, expressions in the Vietnamese version of draft Guideline are by and large appropriate.</p> <p>(J) The style shall be selected carefully and “may ” or ”can” or other appropriate style will be used depending on contents of each provision.</p> <p>Comment No.2 : Reference of regulations except Japan</p> <p>(J) The JIS standards are one of the examples, and the provisions of the Guideline do not stipulate that regulations shall refer to only Japanese standards.</p> <p>(V) It is desired to refer not only to regulations corresponding to JIS but also to all relevant international standards.</p> <p>(J) It is difficult to introduce provisions of international standards due to a copyright violation.</p> <p>(V) It is acceptable to show only numbers of relevant provisions.</p> <p>(J) We agree to your request.</p> <p>Comment No.3 : Guideline for each unit output</p> <p>(J) In general, we cannot classify regulations or guidelines by the unit output of power plant.</p> <p>(V) We agree to JICA Hydro Team’s answer. This proposal seems to have been made for the Thermal Power because the new type of high efficiency equipment with higher pressure and temperature of steam such as supercritical pressure boiler is adopted to the recent power plants which have a large unit capacity.</p> <p>(J) We understand the purpose of your question, so we recommend to discuss the mater in Thermal Team WG meeting.</p> <p>Comment No.4 : Contents of articles</p> <p>(J) We would like you to explain what articles in Vol.4 and Vol.5 are “too general”.</p> <p>(V) For example, Article 91 shall regulate concrete specifications of oil for each oil type.</p> <p>(J) Article 91 regulates disposal of oil, and not specifications of oil.</p> <p>(V) It is requested to add reference issues which were not described in technical regulations to the Guidelines so that they can be used for operation and maintenance of hydropower plants.</p> <p>(J) Guidelines are explanations of QCVN, so they cannot include explanations of all regulations and standards.</p> <p>Article 91 regulates prohibition against discharge of water contaminated with oil, and not regulates specifications of oil.</p> <p>(V) Guidelines shall be useful for daily operation and maintenance of hydropower plants.</p> <p>(J) Guidelines are not operation and maintenance manuals.</p> |   |

Article 91 of QCVN regulates prohibition against discharging oil from a hydropower plant and the guideline explains it. A disposal method of oil is different matter from the prohibition against discharge of water contaminated with oil.

We cannot include the explanation of disposal methods of oil for each type of oil in the guideline of Article 91.

We would like to consult with you about which provisions shall be included in the guideline.

(V) The regulation on management of oil shall be shifted from the part of hydropower to that of general issues. In concrete, it shall be shifted to Chapter 15 of Part 6.

(J) Contents of regulations on management of oil for hydropower, thermal power and network may not be same. And, the contents of Chapter 15 of Part 6 are of drafted by Thermal Power Team.

(V) We will prepare a draft amendment and request you to confirm it after due consultation with Thermal Power Team.

(J) We agree to your proposal.

Comment No.5 : Transformer

(J) We do not understand which volume includes the article indicated in the comment.

(V) We do not discuss the item because this comment may belong to Network Team.

(J) We agree to your proposal.

2. Vol.4 Hydropower

Comment No.1 ~ 8 : Article 91

(V, J) Issue of Article 91 has been already discussed the item in General part.

Comment No.9 : Integration of Article 92 and 95

(J) Article 92 and 95 regulate efficiency and protection of a powerhouse, respectively, so these two provisions cannot be integrated.

(V) We agree to you.

Comment No.10 : Article 95

(J) We do not discuss the item because this comment points out translation and not technical matter.

Comment No.11 : Article 97

(J) You can refer to Vol.5 Article 98-a1 regarding more detailed test methods.

(V) We agree to you.

Comment No.12 ~ 16 : Article 98

(J) This article stipulates that a runner pit shall be dewatered before inspection for safety reason, and not regulates contents of inspection.

(V) A stipulation regarding the purpose and contents of inspection described in the second paragraph of the guideline shall be added to the same article of the regulation.

(J) We will prepare a draft amendment of the technical regulation and guideline, and we would like to discuss them in the WG meeting of tomorrow.

Comment No.17 : Article 99

(J) Detailed explanations of technical requirements which classify structures of penstock are technical handbooks, and not guidelines.

As the guideline on electrical equipment, the provision of Article 99 has sufficient content.

(V) We agree to the guideline prepared by JICA Hydro Team, so it is not necessary to revise it.

Concluded

## 2. Draft Minutes of 17<sup>th</sup> WG Meeting (Hydropower Group-1)

|  |   |
|--|---|
| Date:  | 17th July 2012 14:00~17:10  |
| Participant  | MOIT Mr. Cuong<br>EVN (Vietnam Electricity) Mr. Viet, Mr. Tien, Mr. Hoang and Mr. Ngoc<br>ETC (Electrical Testing Center) Mr. Trung |
| Venue  | MOIT Meeting Room No.207  |
| JICA   | Hydro Team: Mr. Nakamura, Mr. Okada and Mr. Mizuhashi<br>Ms. Ha (Interpreter)   |
| Contents: Working Group Meeting  |   |
| <p>Discussion Contents :</p> <p>JICA Hydropower Team and the Vietnamese counterparts confirmed contents of the 1st draft of the Guideline based on the Technical Comment Table on draft Guideline.</p> <p>In the minutes, a sentence beginning from (J) and (V) means an opinion of JICA Hydropower Team and the Vietnamese counterparts, respectively.</p> <p>1. Vol.4 Hydropower</p> <p>Comment No.1~8 : Article 91</p> <p>(V) We prepared a draft amendment.</p> <p>(J) We will confirm the Vietnamese proposal after translation into English.</p> <p>Comment No.12~16 : Article98</p> <p>(J) We prepared a draft amendment of the technical regulation and guideline.</p> <p>(V) We agree to the JICA Hydro Team's proposal. However, legal provisions in Vietnam shall enumerate all examples, so the words "etc." and "and so on" shall not be used in the technical regulations because these expressions make the sentence unclear.</p> <p>(J) We agree to Vietnamese proposal and delete the word "etc." in provisions of technical regulations.</p> <p>(V) The phrase "in case" shall be used for the case which there are choices of "do" or "do not", and the word "when" shall be used for the case which the item shall be necessarily done.</p> <p>(J) Although we consider that the both expressions "in case" and "when" may have the same meaning in English, we will change wording from "in case" to "when" as the regulation written in Vietnamese is the official one to be promulgated.</p> <p>2. Vol.5</p> <p>Comment No.1 : Part 3 Chapter 3 In progress inspection</p> <p>(J) The phrase "In progress inspection" is also used in another part, so it is desirable that the title of Chapter 3 should be kept as it is.</p> <p>(V) We agree to your proposal that the title of Chapter 3 is kept as it is.</p> <p>If there are any items which are not included in Chapter 3, Section 4 "Power Plant Equipment", it is requested to describe reference standards of such missing items in the</p> |   |

guideline.

(J) Basically, we consider that Chapter 3, Section 4 “Power Plant Equipment” includes all regulations on major equipment.

The title of Article 87-a6, ”Step-up transformer”, is correct when the transformer is used only for power generation, however, the same transformer is used as ”Step-down transformer” for pumping operation at pumped storage power plants, so it is desirable to apply the title of ”Main transformer” for Article 87-a6.

(V) We agree to your proposal. The title of Article 87-a6 shall be “Main transformer”.

Comment No.2 : Article 86

(V) The phrase ”Back-up power system” means “Ancillary power system (for station power supply)”, and not a stand-by power system, so provisions regarding the items shall added to the guideline as “Auxiliary” power system”.

(J) If provisions regarding auxiliary equipment besides major equipment are included in the article, not only an ancillary power system but also telecommunication, illumination, ventilation, drainage, and all other auxiliary systems shall be added to the article, therefore, there would be no limit in provisions.

(V) It is desirable that provisions regarding an ancillary power system and telecommunication system are added to the guideline.

(J) Provisions regarding an ancillary power system and telecommunication system will be added to the guideline Article 86 paragraphs (10) and (11), respectively.

Comment No.3 : Part 3 Chapter 4

(V) We propose that Article 98-a2 of the technical regulation be shifted to 98-a3 and that the new Article 98-a2 which states “provisions regarding inspections in a powerhouse should refer to those in Part3 Chapter 3, Section4” is added.

We propose the above arrangement because a trial operation shall be started after confirmation of all conditions of installation of hydropower equipment, while it would be understood that a trial operation is conducted before confirmation according to the order of provisions in the present draft.

We will prepare a draft amendment by 19th July and we would like you to examine it.

(J) We agree to your proposal.

We consider that the tile of new Article 98-a2 may be “Power plant equipment test” or the like.

Comment No.4 : Article 98-a1

(V) We discussed this comment in the yesterday’s meeting and already concluded.



### 3. Vol.4 General Items

(J) You gave us comments before we gave you our draft of guideline. We would like to confirm the meaning of your comments.

(V) These are our proposals on contents of the guideline.

#### Comment No.1 ~ 5 : Article 5 “Functions of individual units in power system”

(J) Technical regulations are related to only technical and safety matters, but do not regulate economic issues.

(V) The phrase “major economy-technology criteria” means an effective operation which requires optimum operation of power plants. Therefore, this issue is related to a technical requirement.

(J) Does the comment mean that the optimum generation efficiency shall be indicated by numerical values?

(V) Our comment does not request such numerical values but propose the contents of the guideline for Article 5. It is not necessary to add concrete numerical targets in the guideline of Article 5.

The phrase “Power commodity output” means power output to be transmitted to the power grid.

(J) We will propose provisions of the guideline taking into account the ideas proposed by Vietnamese side provided that the contents shall not of deviating from the implication of technical regulations.

#### No.6 : Article 7

(V) Our comment is the same as those of Article 5.

(J) We will propose provisions of the guideline taking into account the ideas proposed by Vietnamese side provided that the contents shall not of deviating from the implication of technical regulations.

Concluded

### 3. Draft Minutes of 18<sup>th</sup> WG Meeting (Hydropower Group-1)

|   |   |
|---|---|
| Date:   | 23rd October, 2012 14:00~16:40  |
| Participant   | EVN (Vietnam Electricity) Mr. Tien<br>ETC (Electrical Testing Center) Mr. Trung |
| Venue   | MOIT Meeting Room No.210  |
| JICA  | Hydro Team: Mr. Nakamura, Mr. Okada, Mr. Mizuhashi<br>Ms. Dung (Interpreter)    |
| Contents: Working Group Meeting   |   |
| <p>Discussion Contents:</p> <p>JICA Hydro Team and the Vietnamese counterparts confirmed proceedings of the breakout sessions.</p> <p>In the minutes, a sentence beginning from (J) and (V) means an opinion of JICA Hydro Team and the Vietnamese counterparts, respectively.</p> <p><u>Agenda-1: How to conduct Workshop in October and the follow-up activities</u></p> <p>(J) In the breakout session A-1 of WS, CRA explains the new technical regulation and pre-draft guideline for hydropower civil works.</p> <p>In the breakout session A-2 and A-3, Mr. Hoa of MOIT takes the chair at the session on the 2nd draft Guideline of Vol.4 Part 4 in 30 minutes and the participants discuss it in 30 minutes and Vol.5 Part 3 in the same manner, respectively. The JICA Project Team supports the discussion, and then the chairperson closes the discussion in the last 10 minutes of each breakout session.</p> <p>(V) Explanation of JICA Team shall be completed in 20 minutes and 40 minutes shall be allocated for discussion.</p> <p>Participants' comments shall only be recorded and replied to them after the workshop in writings in general in order to collect the comments as many as possible.</p> <p>(J) The JICA Project Team and Vietnamese counterpart shall work together to answer comments.</p> <p>(V) The Vietnamese counterpart consolidates comments and sends them to the JICA Project Team. The JICA Project Team shall prepare answers and solutions for mutual agreement.</p> <p>(J) MOIT shall closes receiving comments from participants on November 30.</p> <p>(V) The JICA Project Team shall send answers also to the Vietnamese counterpart this time because the team did not send them to the counterpart in the previous case.</p> <p>(J) The JICA Project Team can not record all questions and answers made in Vietnamese.</p> <p>(V) The both parties shall record the minutes of the workshop.</p> <p>It shall be confirmed if MOC's technical regulation on design and construction of hydropower structures is included in MOIT's technical regulations Vol.4 and 5.</p> <p>(J) The MOC's technical regulation is not included in MOIT's ones.</p> <p>The reception of comments from participants shall be closed on November 30, comments shall be sent from the Vietnamese counterpart to the JICA Project Team, and the both parties will discuss them at working group meetings to be held late in January 2013. The JICA</p> |   |

Project Team will send the final draft of the guideline to the Vietnamese counterpart in mid-March, 2013 and the both parties will confirm its content at the working group meetings to be held in April, 2013. So discussions on the draft guideline shall be completed in January, 2013.

(V) Comments on the second draft guideline shall be reflected in the final draft in December, 2012, and every aspect of it shall be discussed three times in January, 2013.

(J) The both parties shall reach a conclusion on the draft guideline in January, 2013.

It is impossible to prepare unanimous answers, so the both parties shall reach a conclusion in January, 2013.

#### Agenda-2: Comments on the 2<sup>nd</sup> Draft Guideline

Comments on the second draft guideline Vol.4 and Vol.5 were discussed as follows:

1. Article 73 of Vol.4

(J) Is it necessary to replace the term, "Board on flood control" with "Steering committee"?

The Owner is a member of "Board on flood control", while "Steering committee" is a public organization.

(V) It is not necessary to replace the term.

2. Article 100-a5 of Vol.5

(J) Is it necessary to add a provision (7) to the section 1?

Article 122 regulates the same matter as the proposed provision (7), so it is not necessary to add (7) to the section 1.

(V) The Vietnamese version of Article 100-a5 regulates an examination, while Article 122 regulates calibration and not an examination.

In conclusion, it is not necessary to add (7) to the section 1.

3. Article 100-a6 of Vol.5

(J) The phrase "within the next year" shall be revised to "within the next two years" in order to allow earlier inspection within the next year.

(V) The Vietnamese version means that the first periodic inspection for dam safety shall be carried out between the period one year after the date when the reservoir water level reaches the normal high water level and two year after the date, which is liable to cause misunderstanding.

(J) The period is indicated in a figure in the guideline.

4. Article 120 of Vol.5

(J) A meaning of the proposed provision is implied in the existing Article 120, so it is not necessary to add it to Article 120.

(V) The JICA Project Team's solution is agreed

The meaning of word "small" shall be confirmed in the guideline if it shows "invisible" or "unrecognizable".

(J) The word "small" means that a scale of deterioration will not develop.

5. Article 120-a1 of Vol.5

(J) It shall be confirmed if the proposed solution means that water quality shall satisfy requirements of water quality for agriculture.

(V) The JICA Project Team's solution is agreed.

6. Article 121 of Vol.5

(J) Article 122 regulates the same matter as the proposed paragraph 1, so it is not necessary to add it to Article 121.

(V) The Vietnamese version shall be revised to show the correct meaning.

7. Article 121 of Vol.5

(J) It shall be confirmed if it is necessary to add some words to the paragraph 2.

The modification is acceptable in general but the provision shall be revised as "The site where ... unfavorable obstacles in surrounding environment for measuring...".

(V) The JICA Project Team's solution is reasonable and agreed.

Concluded

#### 4. Draft Minutes of 19<sup>th</sup> WG Meeting (Hydropower Group-1)

|   |  |
|---|--|
| Date :  | 8th January, 2013 14:00~16:30  |
| Participant   | MOIT Mr.Cuon<br>MOC Mr.Duong<br>MARD Mr.Dat<br>EVN(Vietnam Electricity) Mr. Tien, Mr.Hoan and Mr.Ngoc<br>ETC(Electrical Testing Center) Mr. Tain |
| Venue   | MOIT Meeting Room No.204   |
| JICA  | Hydro Team Mr. Nakamura, Mr. Okada, Mr. Mizuhashi and Ms. Ha<br>(Interpreter)  |
| Contents: Working Group Meeting   |  |
| <p>Discussion Contents :</p> <p>JICA Hydro Team and the Vietnamese counterparts confirmed conclusions of comments on Guideline Vol.4 discussed in the working group meeting and the 3rd Workshop.</p> <p>In the minutes, a sentence beginning from (J) and (V) means an opinion of JICA Hydro Team and the Vietnamese counterparts, respectively.</p> <p>(1) Working group meeting</p> <p>1. Article 73</p> <p>(J) It is not necessary to replace the organization name "Board on flood control" with "Steering committee".</p> <p>(V) We agree to it.</p> <p>(Conclusion) No change is required for Article 73 of Technical Regulation and Guideline Vol.4.</p> <p>(2) 3rd Workshop</p> <p>1. Article 5 and 7</p> <p>(J) It shall be avoided in general to quote provisions of the existing laws or regulations in the mandatory regulation, but it is acceptable to quote them in Guideline.</p> <p>(V) We agree to it.</p> <p>(Conclusion) No revision is required in the current draft of Technical Regulation and Guideline in general.</p> <p>2. Article 14 (?)</p> <p>(J) Only abnormalities in facilities shall be recorded and reported to the next shift in a form of inspection diary, and it is not necessary to add the provision regarding list of items required for taking over between shifts of operation and maintenance team to the Guideline.</p> <p>(V) We agree to it.</p> <p>(Conclusion) It is not necessary to add the requested content to the draft Guideline.</p> <p>3. to 5. Article50</p> <p>(J) It is not necessary to add thresholds to Table 50-1 to 50-3 since there are no clear thresholds</p> |  |

of monitoring data as dams are constructed on various conditions.

(V) We agree to it. And it shall be specified that Table 50-1 and 2 show examples in Japan and that Table 50-3 shows an example of the minimum requirements on monitoring items and not a mandatory regulation.

(J) We will correct Guideline.

(Conclusion) It is not necessary to add the requested content to Article 50 of the draft Guideline. It shall be indicated in Article 50 of Guideline that Table 50-1 and 50-2 are examples of Japan and that the items in Table 50-3 are examples and not mandatory.

(3) Others

(J) We would like to confirm if the Vietnamese side has other comments on the draft Guideline Vol.4.

(V) In Table 50-4, signs of inequality indicate the opposite direction.

(J) We will correct them in Table 50-4.

(V) In Paragraph 3 Item 4. (3) 2) of Article50, the word “sudden” may not be suitable.

(J) We will replace it with a suitable word.

(V) In Article 78, the phrase “the highest water level” may not be suitable.

(J) We will look up related documents and correct it.

(V) EVN (Mr. Tien) has prepared additional comments on Guideline Vol.4 and 5.

(J) They already missed the deadline.

(V) MOIT will consolidate the comments and send only new comments to JICA Team by tomorrow.

Concluded

## 5. Draft Minutes of 20<sup>th</sup> WG Meeting (Hydropower Group-1)

|   |  |
|---|--|
| Date:   | 10th January, 2013 9:00~12:30  |
| Participant   | MOIT Mr. Cuong<br>EVN (Vietnam Electricity) Mr. Viet, Mr. Tien, Mr. Hoang, Mr. Ngoc<br>ETC (Electrical Testing Center) Mr. Thanh, Mr Trung |
| Venue   | MOIT Meeting Room No.204   |
| JICA  | Hydro Team Mr. Nakamura, Mr. Okada, Mr. Mizuhashi, Mr Umesaki<br>and Ms. Ha (Interpreter)  |
| Contents: Working Group Meeting   |  |
| <p>Discussion Contents :</p> <p>The JICA Hydro Team and the Vietnamese counterparts confirmed conclusions of comments on Technical Regulation and Guideline Vol.5 discussed in the Working Group meeting on 23 October 2012 and the 3rd Workshop on 26 and 30 October 2012 and the contents which have been revised by the JICA Hydro Team on Guideline Vol.5.</p> <p>(4) Working group meeting</p> <p>In this part, the “Comment No.” mentioned below is based on “Conclusion of Comments on Guideline Vol.4 and Vol.5 (Hydropower part)” which is prepared on 10 January 2013.</p> <p>- Comment No. 2 (Article 100-a5)</p> <p>It is not necessary to add Item (7) to Paragraph 1. Accordingly, no change is required for Article 100-a5 of Technical Regulation.</p> <p>- Comment No. 3 (Article 100-a6)</p> <p>Participants confirmed that the first periodic inspection should be conducted within 1 year from the date 1 year after the date when water level of the reservoir reached the high water level. Accordingly, the stipulations in the Article 100-a6 of Technical Regulations Vol.5 and the Guideline Vol.5 will be revised as follows respectively.</p> <p>Technical Regulations: The stipulation will be revised to the same description as the same content stipulated in Circular 34 Article 7.1.</p> <p>Guideline: The illustration which explains the period acceptable for the first periodic inspection will be added.</p> <p>- Comment No. 8 (No.4 in original table) (Article 120)</p> <p>The meaning of the proposed provision is implied in the existing Article 120, so it is not necessary to add it to Article 120. Accordingly, no change is required for Article 120 of Technical Regulation Vol.5.</p> <p>- Comment No. 9 (No.5 in the original table) (Article 120-a1)</p> <p>The JICA Hydro Team’s proposal to revise the provision as "Water quality in a reservoir measured by proper method does not deteriorate significantly, <u>and it shall satisfy the requirements of water quality for agriculture</u>" is agreed by the Vietnamese counterpart. And it was confirmed that the term “water quality” is not translated into Vietnamese correctly.</p> |  |

Accordingly, the 1st item of Article 120-a1 of Technical Regulation Vol.5 will be revised as proposed by the JICA Hydro Team, and the Vietnamese version shall be revised to show the correct meaning of "water quality".

- Comment No. 10 (No.6 in the original table) (Article 121)

It is not necessary to modify Article 121 of Technical Regulation Vol.5 as proposed in the comment, but the Vietnamese version shall be revised to show the correct meaning of "measuring".

- Comment No. 11 (No.7 in the original table) (Article 121)

The stipulations in the Technical Regulation Vol.5 and the Guideline Vol.5 will be revised as follows respectively.

Technical Regulations: "in surrounding environment" will be added after "for measuring" and "such as severe sedimentation; and" will be deleted in Paragraph 2 of Article 121

Guideline: "etc." will be added after "such as severe sedimentation" in the 2<sup>nd</sup> item of Paragraph 2 in Article 121.

(5) 3rd Workshop

In this part, the "Comment No." mentioned below is based on "Comments in 3<sup>rd</sup> Workshop on draft Guideline Vol.5 (Hydropower Part)" which is prepared on 10 January 2013.

- Comment No. 1 (Article 79)

The methodology using each of two formulas mentioned in "Comment" column will be described in the Guideline. (Refer to Item 5 "Other measuring factor absorptivity / absorptance (K))" which was added in Article 79 of the draft Guideline)

It is requested by the Vietnamese counterparts and the JICA Hydro Team agreed to describe both formulas in the Guideline in accordance with Vietnamese practice.

- Comment No. 2 (Article 90)

No revision is required in Figure 90-1 and the current content of Article 90 in the draft Guideline.

- Comment No. 3 (Article 90)

No revision is required in the current content of Article 90 in the draft Guideline as the time for moving to next revolving speed varies depending on actual conditions.

- Comment No. 4 (Article 92)

Article 92 of the draft Guideline will be revised so as to provide clear explanation regarding particular case of load rejection test.

- Comment No. 5 (Article 98-a1)

It is confirmed that the values in Table 98-a1-1 are for reference.

Accordingly, no action is required.



- Comment No. 6 (-)

No action is required as the test items already listed in the Technical Regulation and Guideline for electrical equipment satisfy the requirements.

- Comment No. 7 (-)

It is confirmed that the requirement regarding standby power supply is already stipulated in Article 116.

Accordingly, no action is required.

- Comment No. 8 (Article 123)

No revision is required in Article 123 of the draft Guideline as "three years" is the maximum interval of the mandatory periodic inspection and EVN's regulation satisfies this requirement.

- Comment No. 9 (Article 123)

It is agreed that Table 123-1 will be also shown in the draft Guideline.

- Comment No. 10 (-)

The JICA Hydro Team may add some information regarding inspection and test in the final draft Guideline in a practical and reasonable manner.

Note for clarification regarding the above conclusion.

*The comment of Vietnamese counterparts seems not following the policy in preparation of a guideline which is applicable and useful for all power plants but aiming at preparation of a detailed document like an operation and maintenance manual which shall be prepared at each power plant.*

*In addition, each article related to inspection items for the electrical equipment and power plant equipment to be stipulated in the mandatory technical regulation Vol.5 and its guideline shall cover minimum requirements in terms of purpose of application, required functions and safety requirements.*

*That is, the provision of detailed inspection items beyond necessity will limit alternatives in method of inspection and provide complication and confusion in operation and management of power plants.*

*Therefore, the JICA Hydro Team will reexamine the contents of draft Guideline Vol.5 for the articles related to inspection items of electrical and power plant equipment and may revise or supplement the contents if necessary in consideration of the above policy and the meaning of the request of the Vietnamese counterparts.*

- Comment No. 11 (-)

No particular action is required as the JICA Hydro Team has prepared the draft Technical Regulation and Guideline taking into consideration the present situation in Vietnam.

(The final decision regarding the contents of Technical Regulation and Guideline to be promulgated will be made by the Vietnamese counterparts.)

(6) Revisions on the 2<sup>nd</sup> draft Guideline proposed by the JICA Hydro Team

The JICA Hydro Team explained the revised contents on the Guideline Vol. 5, and the major revisions or supplementing of contents were agreed as follows.

- Article 100-a4

Explanations corresponding to paragraphs 4 to 9 were added to the Guideline.

- Article 100-a8 and 100-a9

Based on the implication of original reference document, the explanation was revised to stipulate that a dam should be inspected in case measured values showing a local situation of a dam indicate extremely abnormal value which may lead to a deterioration in overall safety of a dam.

- Article 108

Revision of Paragraph 3 regarding sedimentation is acceptable for English versions. However, the Vietnamese version is difficult to understand due to incorrect translation. Therefore, Vietnamese versions shall be reviewed and corrected according to the English versions.

- Article 113

The phrase “after heavy rain” shall be revised as “after heavy rain and earthquake”.

(7) Others

The other revisions on the draft Guideline were agreed as follows:

- Article 78

The content of Paragraph 1 of Vietnamese version is different from that of English version. Therefore, the Vietnamese version shall be revised (translation issue).

- Article 100-a8

The Vietnamese counterpart explained that the uplift measurement devices are arranged independently from the drain holes in Vietnam.

In the above regard, the explanation that the measurement method of uplift by closing valve is adopted only when the drain holes are used for uplift measurement will be added.

- Article 116

“Satisfying the requirements of inspection items listed in Article 116” shall be revised as “Satisfying the requirements of inspection items listed in Article 116 of Technical Regulation Vol.5”

- General

The Vietnamese counterpart pointed out that there are words or phrases which are difficult to understand in the Vietnamese version of draft Guideline.

In the above regard, the Vietnamese version shall be checked for correction of inappropriate translations.

Concluded

## 6. Draft Minutes of 10th WG Meeting (Hydropower Group-2)

|  |  |
|--|--|
| Date:  | 15th January, 2013 14:00~17:30   |
| Participant  | MOC Dr. Ha, Mr. Duong<br>MARD Mr. Tuan Anh<br>EVN(Vietnam Electricity) Mr. Hoang, Mr. Ngoc<br>CRA Ms. Thuy |
| Venue  | MOC Meeting Room No.219  |
| JICA   | Hydro Team Mr. Nakamura, Mr. Mizuhashi, Mr Umesaki Ms. Hai and<br>Ms. Ha (Interpreter)                     |
| Contents: Working Group Meeting  |  |
| <p>Discussion Contents:</p> <p>JICA Hydro Team and the Vietnamese counterparts discussed the comments on the Technical Regulation which was prepared by JICA team, and confirmed the agenda of the workshop which will be held at 17<sup>th</sup> Jan. 2013.</p> <p>(8) Comment on QCVN</p> <p>In this part, the contents are based on “Comment of JICA on draft Technical Regulation on Hydropower Civil Works (December 2012 version).</p> <p>- Article 3.32</p> <p>The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for Article 3.32 of TR.</p> <p><i>(It is suggested that the deformation joint be defined accurately to avoid misunderstanding.)</i></p> <p>- Article 3.36, 5.3 (Table 3)</p> <p>The solution mentioned in “Conclusion (tentative)” column is agreed. The supplemental explanation is to be added to the Guideline.</p> <p>- Article 4.2.1</p> <p>MARD informed that the table of classification criteria by plant capacity has been deleted by MARD in the latest QCVN 04-05. So the stipulation in the draft Technical Regulation shall be confirmed referring the latest regulation in Vietnam.</p> <p>- Article 7.1.8</p> <p>The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for Article 7.1.8 of TR.</p> <p>- Article 7.1.3</p> <p>Participants agree that it is hard to conduct actual plant operation following the stipulation in the current draft of TR which was prepared based on the QCVN 04-05 so that the comment of JICA Team is reasonable.</p> <p>MARD informed that they would start the procedure for revision of QCVN 04-05 in January or February 2013, and MARD recommended JICA Team to submit a comment on this matter</p> |  |

to MOC for their consideration to propose the revision of Article 4.4 of QCVN 04-05 to MARD.

In the above regard, the content in the QCVN 04-05 and the Technical Regulation may be revised based on the opinion of JICA Team below:

“The minimum volume of water to be discharged to the downstream shall be decided taking into account of each circumstances of the project based on an environmental impact assessment”.

- Article 7.1.9

The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for Article 7.1.9 provided that the unit on the infiltration coefficient shall be changed from m/day to m/24hours.

- Article 7.1.13

The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for item c) in Article 7.1.13.

In addition, Vietnamese side requested and JICA Team agreed to revise 7.1.13 a) from “safely during the design and check circumstances” to “safely in all discharge levels including the design and check flood circumstances”.

- Article 7.1.14 to 7.1.17

Vietnamese side (Dr. Ha of MOC) proposed and JICA Team agreed in principal to move the Articles 7.1.14 to 7.1.17 into 7.3.

- Article 7.1.17

JICA Team recommended Vietnamese side to delete Article 7.1.17 as stated in the comment table.

The participants agreed that the solution regarding the comment of JICA Team would be discussed more in the workshop of MOC on January 17.

- Article 7.3.1.3 to 7.3.2.3

The solutions mentioned in “Conclusion (tentative)” column are agreed. Accordingly, no change is required for Article 7.3.1.3, 7.3.1.4, 7.3.1.7 and 7.3.2.3.

- Article 7.3.2.4

JICA Team recommended Vietnamese side to delete Article 7.3.2.4 as stated in the comment table.

The participants agreed that the solution regarding the comment of JICA Team would be discussed more in the workshop of MOC on January 17.

- Article 7.3.2.5

JICA Team recommended Vietnamese side to delete Article 7.3.2.5 as stated in the comment table.

MARD informed that they were studying the Chinese standard regarding the softening coefficient because there is no standard in Vietnam regarding softening coefficient.

Accordingly, the participants agreed that the solution regarding the comment of JICA Team would be discussed later because the reference standard is under preparation by MARD.

- Article 7.3.2.6

The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for Article 7.3.2.6.

- Article 7.3.4.1

The solution mentioned in “Conclusion (tentative)” column is agreed as Article 7.3.4.1 just stipulates the minimum crest width only so that a wider width can be applied to a large dam. Accordingly, no change is required for Article 7.3.4.1.

- Article 7.3.4.2

The solution mentioned in “Conclusion (tentative)” column which is to follow the existing Vietnamese standards is agreed though paragraph a) regarding the vertical distance between galleries of not over 20m may be too short. Accordingly, no change is required for Article 7.3.4.2.

- Article 7.3.4.3

The solution mentioned in “Conclusion (tentative)” column is agreed, though settlement joint is not applied in general in Japan. Accordingly, no change is required for Article 7.3.4.3.

- Article 7.3.4.4

Vietnamese side proposed and JICA Team agreed to study more about the application of settlement joint and thermal-settlement combination joint to finalize the stipulation of Article 7.3.4.4. In this regard, Vietnamese side (Mr. Hoang of EVN) recommended JICA Team to refer to TCXDVN-335 to confirm the application of joints in Son La project.

Accordingly, the matter would be discussed in the MOC Workshop scheduled on January 17.

- Article 7.3.4.5

The participants agreed that the solution regarding the comment of JICA Team would be discussed more in the workshop of MOC on January 17.

- Article 7.4

The solution mentioned in “Conclusion (tentative)” column is agreed. Accordingly, no change is required for Article 7.4.

- Article 7.12.1

The solution mentioned in “Comment of JICA Team” column is agreed. Accordingly, the item d) of Article 7.12.1 will be revised as proposed by JICA Team.

- Article 7.12.2

It is confirmed that the term “underwater parts of powerhouse” indicate “the part of powerhouse below turbine floor”.

It is agreed that the interpretation of the term “underwater parts of powerhouse” will be explained in the Guideline.

- Article 7.12.3 to 7.12.4

Vietnamese side suggested that the current stipulations of item b) of Article 7.12.3 and Article 7.12.4 in the draft TR are acceptable. Accordingly, no change is required for these articles.

- Article 7.12.5

Participants agreed to delete Article 7.12.5 as proposed by JICA Team.

- Article 7.13.1

Participants agreed to delete Article 7.13.1 because this is a matter of course.

- Article 7.14.1

Participants agreed to delete the 2<sup>nd</sup> item of paragraph c) of Article 7.14.1 because this provision cannot be always applied to all hydropower plants.

- Article 7.14.4

This provision shall be discussed more in the MOC Workshop on January 17 because it is necessary to clarify structure and role of the bottom outlet work.

(9) Confirmation on the agenda of the workshop

The agenda of the MOC Workshop which will be held on 17<sup>th</sup> Jan. 2013 was confirmed.

Concluded

## 7. Draft Minutes of 21<sup>th</sup> WG Meeting (Hydropower Group-1)

|   |   |
|---|---|
| Date:   | 18 <sup>th</sup> April, 2013 10:00~11:00  |
| Participant   | MOIT: .-----<br>EVN(Vietnam Electricity): Mr. Ngoc<br>ETC(Electrical Testing Center): ----- |
| Venue   | MOIT Conference room No. 208  |
| JICA  | Hydropower Team: Mr.Nakamura, Mr.Okada<br>Ms. Cao My Ha (Interpreter)                       |
| Contents; Working Group Meeting   |   |
| <p>Agenda:</p> <p>JICA Hydro Team and the Vietnamese side member of WG1 hold a meeting concerning the two (2) major issues, regarding hydropower, which are the confirmation of major revisions in the draft of Technical Regulation Vol.4 and Vol.5 from the original QCVN and the confirmation of the final draft of Guideline Vol.4 and Vol.5 prepared in accordance with the conclusions in WG1 Meeting on Jan. 8 and 10, 2013.</p> <p>The material used for the meeting (Attachment-1 to 3) are as follows.</p> <ol style="list-style-type: none"> <li>1. Guideline for Technical Regulation Volume 4 Operation and Maintenance of Power Plants and Grid (General Part (Part 1-3))</li> <li>2. Guideline for Technical Regulation Volume 4 Operation and Maintenance of Power Plants and Grid (Hydropower Part (Part 4))</li> <li>3. Guideline for Technical Regulation Volume 5 Inspection of Power System Facilities (Hydropower Part (Part 3))</li> </ol> <p>However, efficient discussion could not made in the meeting as the attendance of the Vietnamese side member of WG1 was only one person from EVN.</p> <p><u>&lt; The reference opinions of Mr. Nhoc are as follows; &gt;</u></p> <ol style="list-style-type: none"> <li>1) It is better that the meeting material mentioned above are sent to the Vietnamese WG members through MOIT in order to study them by themselves.</li> <li>2) The information mentioned above is basically acceptable by Mr. Ngoc.</li> <li>3) It is better to get a opinion of Mr. Tien (EVN), because many opinions are made by himself.</li> </ol> <p><u>&lt; Explain of JICA are as follows; &gt;</u></p> <ol style="list-style-type: none"> <li>1) This WG1 meeting is arranged in order to confirm the contents of hydropower parts in the final draft GL Vol.4 and Vol.5.</li> <li>2) As it is difficult to make a substantial discussion in this WG Meeting, we close the meeting today.</li> <li>3) However, as this WG Meeting is the last opportunity to discuss the contents of draft TR and GL, the JICA Hydropower team understands that he Vietnamese WG members accepted the drat TR and GL in principal.</li> </ol> <p style="text-align: right;">Concluded</p> |   |

## **Attachment-1**

### **Guideline for Technical Regulation Volume 4 Operation and Maintenance of Power Plants and Grid**

#### **(General Part)**

#### **1. Major items modified /added in Final draft of GL Vol.4 (Part 1 to 3)**

- 1) The words “shall” or “should” were replaced with “must” in each Article.
- 2) The words “this Technical Regulation” was replaced with “Technical Regulation Vol.4” in each Article.
- 3) Article 15 “General requirements for personnel preparation”, Paragraph 2 was supplemented according to the comment form EVN.
- 4) Article 39 “Stability of plan” was supplemented according to the comment form EVN.
- 5) Article 40 “Railway and road” was supplemented according to the comment form EVN.  
(Refer to GL, final draft of Vol.4 Part 1-3.)

#### **2. Essential point modified /added in final version of QCVN Vol.4 (Part 4)**

Major points of modification from the existing original QCVN Vol.4 are as follows;

- a) Scope of application was not changed for network.
- b) Scope of application was changed for hydropower to “civil works and electrical equipment of all hydro power plants located in Vietnam and connected to the National Grid”.
- c) Scope of application was changed for thermal power to “all thermal power plants located in Vietnam and connected to the National Power Transmission Network”.
- d) Definition of National Power Transmission Network was determined to be “the transmission network of more than 110 kV voltages which is developed, installed, controlled and managed by the Government of Vietnam.”
- e) Article 27 “Investigation and report of accident” was supplemented for breakdown in equipment operation and for recording in statistics according to the investigation procedure and listing procedure of Ministry of Industry and Trade
- f) Article 48 was modified to provide only basic requirement regarding corrosion protection.
- g) Title of some Articles was changed as follows:



| <b>Article</b> | <b>Old Title in the existing QCVN</b>                             | <b>New Title</b>  |
|----------------|---|---|
| Article 5      | Duties  | Functions of individual units in power system                               |
| Article 6      | Liabilities of Electrical Units                                   | Obligations of individual units in power system                             |
| Article 7      | Responsibilities of Electrical units                              | Internal responsibilities of individual units in power system               |
| Article 8      | Standpoint of inspection at completion                            | Operating condition of power works  |
| Article 12     | Taking over of Parts  | Acceptance of component   |
| Article 14     | Hand over documents   | Handover of technical documents   |
| Article 15     | Personnel standards   | General requirements for personnel preparation                              |
| Article 14     | Staff test  | Knowledge test for personnel  |
| Article 22     | Record  | Installation of equipment for record  |
| Article 27     | Report of accident  | Investigation and report of accident  |
| Article 34     | Compliance with regulations                                       | Compliance with technical standards for operation                           |
| Article 35     | Statistic and investigation accidents                             | <i>(deleted and combined with Article 27)</i>                               |
| Article 36     | General requirements  | Hygienic condition for plan, house and powerhouse plant                     |
| Article 37     | Warning sign and numbering  | Indication of water route, gas pipeline and cable route                     |
| Article 39     | Treating settlement   | Stability of plan   |
| Article 40     | Management, maintenance of railway and road                       | Railway and road  |
| Article 41     | General requirements with operation and maintenance of facilities | Principles in maintenance   |
| Article 42     | <i>(no title)</i>   | Article 42. Routine and emergency Inspection of houses, works and equipment |
| Article 43     | Checking, monitoring  | Check of houses and works on particular ground                              |
| Article 44     | Check of construction of houses and works                         | Check of durability of houses and works                                     |
| Article 45     | <i>(no title)</i>   | Countermeasures for fractures and damages                                   |
| Article 46     | <i>(no title) (Check of chimney)</i>                              | <i>(deleted)</i>  |
| Article 47     | <i>(no title)</i>   | Alteration of facilities  |
| Article 48     | <i>(no title)</i>   | Corrosion protection of metal structures                                    |

## **Attachment-2**

### **Guideline for Technical Regulation Volume 4 Operation and Maintenance of Power Plants and Grid (Hydropower Part)**

#### **1. Summary for Final draft of GL Vol.4 (Part 4)**

- 1) Final draft of GL Vol.4 (Part 4) for the hydropower generation part is composed in accordance with the composition of Technical Regulation (QCVN=TR) Vol.4. The same Article numbers are arranged for GL following the numbers in QCVN.
- 2) The basic purpose of GL is to provide the users of QCVN with guidance in order to understand the stipulations in QCVN. Hence, The GL explains each article of QCVN about its background, meaning, basic numerical criteria for reference, example of application, etc. For these purpose, therefore, tables and/or figures are presented in GL as much as possible for easy understanding.
- 3) GL, however, does not provide guidance for all facilities installed in hydropower stations. This is because QCVN stipulates minimum requirements for the management of safe and/or stable operation of the facilities installed in the hydropower stations and GL only explains these basic requirements stipulated in each Article of QCVN. Therefore, this GL is not a document which describes the detailed issues to be handled by an operation and maintenance manuals of all facilities installed in the hydropower station.
- 4) Each hydropower station, therefore, must prepare the operation and maintenance manuals describing necessity inspection and test methods based on the requirements of QCVN for necessary management and maintenance of all facilities installed in the hydropower station.

#### **2. Major items modified /added in Final draft of GL Vol.4 (Part 4)**

- 1) Table of Abbreviation List was added after Table of Contents.
- 2) The words “shall” or “should” were replaced with “must” in each Article.
- 3) In Article 51, it was clarified that Table 50-1 and 50-2 were examples of Japan. Also, it was clarified that Table 50-3 showed the recommended items (not mandatory items).  
The word “sudden” in item 4 (3) 2) of Paragraph 3 was replaced with “abnormal”.
- 4) In Article 78, the phrase “highest water level” will be replaced with “allowable water level”. (This has not done yet.)
- 5) Some Articles were modified for minor description.  
(Refer to GL, final draft of Vol.4 Part 4.)

#### **3. Essential point modified /added in final version of QCVN Vol.4 (Part 4)**

- 1) Major points of modification from the existing original QCVN Vol.4 are as follows;
  - a) Though we basically followed the composition of the original QCVN, some provisions were moved to GL for the descriptions related to the

- inspection method in the contents of each Article and detailed inspection items for the facilities.
- b) Scope of application was changed to “civil works and electrical equipment of all hydro power plants located in Vietnam and connected to the National Grid”.
  - c) The following Articles in Chapter 4 Hydraulic Turbine / Generator were modified.
    - \*Article 91. Oil treatment (moved to Article 382-a1 in Part 6)
    - \*Article 98. Runner inspection (modified the title of article from “Work in turbine pit”.)
- 2) Inspection item of Article 97 “Vibration” in Vol.4 was stipulated by referring to Article 98-a1 in QCVN Vol.5 in order to avoid reiteration of the same descriptions in QCVN according to the conclusion of WG meeting.

## **Attachment-3**

### **Guideline for Technical Regulation Volume 5 Inspection of Power System Facilities (Hydropower Part)**

#### **1. Summary for Final draft of GL Vol.5 (Part 3)**

- 1) Final draft of GL Vol.5 (Part 3) for the Hydropower generation part is composed in accordance with the composition of Technical Regulation (QCVN=TR) Vol.5, which consists of the three (3) inspection categories of In progress Inspection (Dry inspection), Completion Inspection (Wet inspection) and Periodic Inspection basically. The same Article numbers are arranged for GL following the numbers in QCVN.
- 2) The basic purpose of GL is to provide the users of QCVN with guidance in order to understand the stipulations in QCVN. Hence, The GL explains each article of QCVN about its background, meaning, basic numerical criteria for reference, example of application, etc. For these purpose, therefore, tables and/or figures are presented in GL as much as possible for easy understanding.
- 3) GL, however, does not provide guidance for all facilities installed in hydropower stations. This is because QCVN stipulates minimum requirements for the management of safe and/or stable operation of the facilities installed in the hydropower stations and GL only explains these basic requirements stipulated in each Article of QCVN. Therefore, this GL is not a document which describe the detailed issues to be handled by an operation and maintenance manuals of all facilities installed in the hydropower station.
- 4) Each hydropower station, therefore, must prepare the operation and maintenance manuals describing necessity inspection and test methods based on the requirements of QCVN for necessary management and maintenance of all facilities installed in the hydropower station.

#### **2. Major items modified /added in Final draft of GL Vol.5 (Part 3)**

- 1) Replaced “shall” or “should” with “must” in each Article according to the conclusion of WG on Jan.10, 2013.
- 2) Deleted “if any” shown in each Article according to the conclusion of WG on Jan.10, 2013.
- 3) Added a table of “Abbreviation” shown in each Article.
- 4) Added a table of “Reference Vietnamese and International Documents” shown in each Article.
- 5) Modified and/or added “a title of documents” for the reference documents of each Article.
- 6) Modified and/or added to the following Article according to the result of WG on Jan.10, 2013.
  - a) Chapter 3 In Progress Inspection, Section 1 Generator/Generator-Motor, Article 79. Insulation resistance measurement;  
Added Item 5. Other measuring factor absorptivity / absorptance (K)
  - b) Chapter 4 Completion Inspection,

- Article 92. Load and input rejection tests;  
Modified description of a load rejection for 2-units in Item 2.
- c) Chapter 4 Completion Inspection,  
Article 98-a1. Vibration measurement;  
Modified description of a type of Generator in < e.g. >.
  - d) Chapter 5 Periodic Inspection, Section 4-8 Generator, Hydraulic turbine and Other auxiliaries, Article 123 Frequency of periodic inspection;  
Added Table 123-1 Frequency of periodic inspection.
  - e) In Article 100-a6, it was clarified, according to Circular 34 Article 7.1, that the first periodic inspection for dam safety should be carried out within the second year from the initial impounding date, and an illustration was added in order to make this stipulation clear.
  - f) In Article 100-a8, the phrase “in case a valve is installed in a drain hole to measure uplift” was added.
  - g) In Article 113, the words “or earthquake” was added.
  - h) In Article 120-a1 of Vietnamese version, translation of the words “water quality” was revised correctly. (to be confirmed)
  - i) In the second item of Paragraph 2 in Article 121, the words “in surrounding environment” and “etc.” were added.  
Also in the Vietnamese version, translation of the word “measuring” was revised correctly. (to be confirmed)
- 7) Modified minor descriptions (Refer to GL ,final draft for approval, of Vol.5 Part 3.)
- 8) Vietnamese version of Article 78 Paragraph-1 and Article 108 shall be checked again in terms of quality of translation.

### **3. Essential point modified /added in final version of QCVN Vol.5 (Part 3)**

- 1) Major points of modification from the existing original QCVN Vol.5 are as follows;
- a) Though we basically followed the composition of the original QCVN, some provisions were moved to GL for the descriptions related to the inspection method in the contents of each Article and detailed inspection items for the facilities.
  - b) Scope of application was changed to “civil works and electrical equipment of all hydro power plants located in Vietnam and connected to the National Grid”.
  - c) The four (4) Sections were added in Chapter 3 In Progress Inspection as follows:
    - Section 1 Generator / Generator-motor,
    - Section 2 Turbine / Pump-turbine
    - Section 3 Auxiliary Equipment of Turbine / Generator
    - Section 4 Power Plant Equipment (PPE)
  - d) Section 4 Power Plant Equipment (PPE) was added with Articles from 87-a1 to 87-a9.
  - e) Characteristics measurement of the excitation system was added for the generator. (Article 83-a1)
  - f) Fire extinguisher system test was added for the generator and power plant. (Article 86-a2 & 87-a9)
  - g) In order to conform with the stipulations in Circular Decree No.72/2007/ND-CP, Circular No.34/2010/TT-BCT, etc., Chapter 5 “Periodic Inspection” was divided into 4 Sections as follows:
    - Section 1 “General”
    - Section 2 “Periodic Inspection for Flood Control”,
    - Section 3 “Periodic Inspection for Dam Safety”
    - Section 4 “Periodic Inspection for Overall Power Plants Facilities”
  - h) Article 120-a1 “Water quality in reservoir” was added as a new article.

- 2) Inspection items commonly applied to all of the hydropower, thermal and network facilities are not described in Part 3, but it is requested to refer to Articles in other Parts in order to avoid reiteration of the same descriptions in QCVN according to the conclusion of WG meeting. However, an additional description is shown in Articles of special inspection applied to particular equipment of the hydropower station.

## 8. Draft Minutes of MOC's Workshop on T/R & GL on Hydropower Civil Works

|   |   |
|---|---|
| Date :  | 17th January, 2013 8:45~12:30   |
| Participant   | <p>MOC: Dr. Tran Huu Ha, Mr. Bui Van Duong (Science Technology &amp; Environment Dept.)<br/> Mr. Nguyen Dai Minh (Institute for Building Science and Technology)<br/> Mr. Pham Ba Hung (State Authority for Construction Quality Inspection)<br/> Mr. Pham Duc Hinh, Mr. Hoang Quang Nhu (Construction Activities Management Dept.)</p> <p>MARD: Mr. Nguyen Tuan Anh (Science Technology &amp; Environment Dept.)</p> <p>EVN: Mr. Le Lim Ngoc (Science Technology &amp; Environment Dept.)</p> <p>CRA(The Center for Water Research and Engineering Application) :<br/> Assoc. Prof. Dr.Le Quang Vinh</p> <p>University for Civil Engineering (Construction University): Prof. Vu Liem Chinh (Director of Mechanical and Construction Company), Mr. Nguyen Duy Thai (Civil mechanical Faculty)</p> <p>Song Da Construction Consultant Co., ltd - Ukraine: Mr. Nguyen Duc Nha</p> <p>Song Da Group Mr. Hoang Van Thac, Mr. Nguyen Thanh Thuong</p> <p>PECC1: Mr.Le The Phong</p> <p>Vinaconex Corporation Mr. Nguyen Ngoc Long</p> <p>STAMEQ Mr. Ngo Tat Thang (Directorate for Standard, Metrology and Quality)</p> <p>Safety production Company AGOOD: Mr. Nguyen Thanh Ngan</p> |
| Venue   | MOC Meeting Room No.117   |
| JICA  | Hydro Team Mr. Nakamura, Mr. Mizuhashi, Mr. Umesaki Ms. Hai and Ms.Do Thi Hoai Thu (Interpreter)  |
| Contents: Internal Workshop   |   |
| <p>Discussion Contents :</p> <p>JICA Hydro Team and the Vietnamese experts discussed the draft Technical Regulation and the draft Guideline on Hydropower Civil Works.</p> <p>After explanation by the JICA Hydro Term on the above documents, the Vietnamese experts asked questions.</p> <p>(10) Technical Regulation on Hydropower Civil Works</p> <p>1) MOC Mr. Minh</p> <ul style="list-style-type: none"> <li>- There is inconsistency between Articles 3.20 and 7.1.17 of draft Technical Regulation regarding the stipulation on concrete strength. The stipulation in Article 3.20 is only regarding compressive strength and tensile strength, although that in Article 7.1.17 is regarding bending strength.</li> <li>- In Vietnam, there are many stipulations relating to the quality of concrete such as durability, standard strength, calculation strength and so on and their classification code. If the stipulation regarding concrete in the draft Technical Regulation is ambiguous, it will be harmful for the</li> </ul> |   |

plant quality. Therefore, it is necessary to compile integrated contents regarding the grades and types of concrete.

- There are some examples caused by reservoir induced earthquake in Vietnam. How about in Japan.

JICA Team)

Some dams in Japan might have caused reservoir induced earthquake, but damages are not reported because the seismic intensity of ordinary earthquakes as well as design seismic load of architectures is much stronger than that caused by reservoir induced earthquake.

2) MOC Mr. Nhu

- The contents on definition of concrete strength should be more accurate. What is the testing sample used in this definition? Cubic or cylinder or else? Because compressive strength will be tested on sample different from tensile strength. Also, there is no stipulations for RCC material but there is stipulations only for normal concrete. So, stipulations regarding the concrete of RCC dam which are constructed widely in Vietnam shall be added because some of them have caused various problems. Especially, regulations on water tightness of RCC shall be provided.

3) MOC Mr. Hung

- I just carried out a dam inspection in Tay Nguyen region about material of filling soil but there is no stipulation about termite and wild weed to refer to for the inspection. Please supplement procedure of dam maintenance such as: time of maintenance regarding the concrete material and filling soil material. In some projects in Vietnam, many problems occurred because the design was made not taking into consideration the effect of natural environment and plant durability sufficiently. The stipulations shall be composed regarding the material for construction such as concrete and soil taking into consideration maintenance term.

4) Song Da Construction Consultant Co. Ltd. - Ukraine Mr. Nha

- Regarding Article 7.14.4, the stipulations for bottom outlet works should be moved to other regulation. E.g., as the 3A Hydropower Plant has the dam height of only 20m, where can we arrange a bottom outlet? Also, as the gravity concrete dam is very safe, it is no need to have a bottom outlet. Furthermore, cost for constructing a bottom outlet is very high, Therefore, it is not necessary to provide with the provision of the bottom outlet works in the draft Technical Regulation.

5) MOC Mr. Hinh

- One of the purposes of this project is keeping safety during construction. Issues related to labor safety shall be added.

Dr. Ha (MOC):



Labor safety standard is under preparation in Ministry of Labor. Addition of safety matters which is specifically related to construction of hydropower plant will be considered.

(11) Guideline on Hydropower Civil Works

JICA Hydro Team briefly explained the outline of draft Guideline as follows:

Mr. Mizuhashi:

- The draft Guideline consists of the following contents:
  - 1) Interpretation of the stipulations in Technical Regulation (detailed explanation)
  - 2) Introduction of related standards and regulations in Vietnam and foreign countries such as the USA and Japan.
  - 3) Examples

Mr. Umesaki (hydromechanical part)

- We prepared the draft Technical Regulation so as not to obstruct the use of equipment and material purchased from foreign countries.
- In the above regard, we have not stipulated the particular requirements in Vietnam but stipulated required performance to be achieved by applying a set of Vietnamese or foreign or international standard.
- In the draft Guideline, we stipulated methodologies for satisfying the required performance stipulated in the Technical Regulation.

Regarding the draft Guideline, the Vietnamese experts raised the following comments:

1) MARD Mr. Tuan Anh

- The Guideline is defined as explanation for the Technical Regulation, but some contents in the draft Technical Regulation are not covered with it.
- In Article 4.2.1, contents regarding agriculture are stipulated in other QCVNs, the contents in this article shall be deleted.

*(This comment seems misunderstanding because Article 4.2.1 of Technical Regulation stipulates the issues only related to hydropower.)*

- The classification on hydropower plant is suitable for some projects, but it is not always appropriate for whole projects. In QCVN 04-05 of MARD, the classification has two steps. The first step is sorting by type of the project, and the second step is by scale of the project. So, it is recommended for draft Technical Regulation for Hydropower to follow the same manner of classification as QCVN 04-05.
- The stipulation of Article 4.2.2 of draft Technical Regulation does not cover all cases. It is recommended to just refer to Article 3.2.2 of QCVN 04-05 of MARD which has sufficient contents.

2) Construction University Prof. Chinh

- Regarding hydromechanical equipment, the descriptions of Chapter 8 of draft Guideline are

too long, and some technical terms are used inadequately. (translation matter) So, it is recommended to review the translated technical terms in Vietnamese version.

For example, lift force is explained in Article 8.1.2 (9), and the relevant regulations existing in Vietnam shall be referred to.

Also, definitions of loads are not appropriate. It is recommended to refer the definitions in the existing technical standards in Vietnam.

- There are many TCVNs which stipulate specific procedure for design. But in this draft Guideline, the stipulations are not provided specifically.

JICA Hydro Team replied to the above comments of Prof. Chinh as follows:

- 1) Translation issues will be solved separately by the time of promulgation.
- 2) The policy of composing the draft Technical Regulation and Guideline regarding hydromechanical equipment is to adopt various TCVNs as well as internationally accepted standards.
- 3) Specific procedures are to be determined by means of referring to the standard which is adopted project by project, and fundamental requirements to be satisfied in all projects are stipulated in the draft Technical Regulation and explained in the draft Guideline.

Construction University Prof. Chinh :

- It is recommended to provide the draft Guideline with a phrase that it is necessary to refer TCVNs and internationally accepted standard.
- Also, it is recommended to put the first priority to the Vietnamese standard for the project in Vietnam.

3) MOC Mr. Minh

- The objective and structure of the proposed draft Guideline are suitable and referring to standards in other countries is preferable because it helps readers' understanding.
- The introduction which aims to clarify the objective of the draft Guideline such as the contents of explanation on objective of the draft Guideline in this workshop by power point shall be added.
- The referring part shall be indicated by some means such as italic font and indented, and the note such as "italic font means referring part" shall be added.
- The list of reference documents and explanations of technical terms shall be added in order to confirm the original contents by referring the original documents.
- It is recommended to provide the draft Guideline with more explanations for some particular technical terms which are not familiar in Vietnam such as MCE in Article 3.18.

4) PECC1 Mr. Phong

- The cord of the regulation which stipulates regarding the electrical equipment shall be

mentioned in the draft Guideline.

If the electrical equipment is out of scope of the draft Technical Regulation for Hydropower Civil Works, such matter shall be clarified in the scope of application.

- The stipulations relating pumped storage power plants shall be added.
- The order of the definitions shall be rearranged in proper order. For example they will be sorted into reservoir relating words, dam relating words, and so on.
- The scope of application in the proposed draft Technical Regulation is that the project whose output is more than 30MW shall be adopted. In this case, it is not clear how to regulate the project whose output is less than 30MW. This matter shall be clarified.
- As there are not enough substantial data regarding MCE in Vietnam, the explanation regarding earthquakes shall be added to the draft Guideline.
- Regarding the project classification, it is recommended to classify the projects by their type. And classification by reservoir capacity is not important, but it is proposed to apply the classification of hydropower project by environmental impact. It is recommended to add explanation of the practical method of project classification to the draft Guideline.
- The same stipulation of Article 7.1.3 regarding the required discharge to downstream may be regulated also by MOIT. This matter shall be confirmed.
- In Article 3.9 (f), of draft Technical Regulation, there is no mention about traffic roads or construction roads which shall be a part of relevant facilities.
- In Article 7.3.5 of draft Guideline regarding other type of dam, the recommendable design standards in foreign countries to be used for design shall be added.
- In Article 7.16.1 of draft Technical Regulation, it is stipulated that monitoring devices shall be installed for the structures of Class II and above. However, there are other stipulations in the exiting Vietnamese standards which require monitoring device for the structure of Class III or lower classes. As there may be inconsistency between these stipulations, this matter shall be confirmed.

#### 5) EVN Mr. Ngoc

- The objectives and framework of the draft Guideline are acceptable.
- It is enough to refer to only the number of Articles and name of reference document for the contents which refer to other standards or other documents in principle. All provisions shall not be described in the Guideline but important contents of which shall be taken care shall be mentioned.

#### 6) Song Da Construction Consultant Company Mr. Nha

- In the draft Guideline, there are some descriptions which are considered to be mandatory requirements to be stipulated in the Technical Regulation. If the requirements are mandatory,

they shall be moved to the Technical Regulation.

7) Song Da Construction Company Mr. Thac

- The comment regarding the draft Technical Regulation and the Guideline will be sent to MOC after collecting them through the company.
- The major concern in the company which we are worrying about is that the current design method based on Russian, Chinese and Vietnamese standards, and current equipment will be prohibited to use by promulgation of new Technical Regulations.

JICA Team)

The design method shall be only modified when the stipulation in the Technical Regulation is stricter than the current method. And the new Technical Regulation will be applied to the projects which are implemented after the Technical Regulation is promulgated.

8) MOC Dr. Ha

- It shall be noted during carrying out the project, the objective of the technical standard is different between in Japan and in Vietnam. In Japan, the owners assure the safety and reliability of the plants, but in Vietnam, the investors play a critical role. The technical standards are required for investors to control engineering consultant, construction companies and so on to make the quality of plant high. Moreover, the investors are governed strictly by the commission of the government.

9) Song Da Consultant Company Mr. Nha

- Vietnamese technical regulation on foundation treatment of dams shall be left because it can assure quality of water tightness of a dam. Regarding technical regulations of Laos prepared by the JICA's technical cooperation, technical requirements on design flood are stricter than those in Vietnam.

JICA Team)

The draft Guideline describes Vietnamese and foreign technical standards on foundation treatment of a dam.

As the time is up, Dr. Ha of MOC closed the workshop meeting by expressing his gratitude for lively discussion.

Concluded

## **Appendix-4.2**

### **Minutes of Working Group Meeting (Thermal Power Group)**

|    |   |             |
|----|---|-------------|
| 1. | Minutes of 16 <sup>th</sup> WG Meeting ( Thermal Power Group) | 23/Aug/2012 |
| 2. | Minutes of 17 <sup>th</sup> WG Meeting ( Thermal Power Group) | 27/Aug/2012 |
| 3. | Minutes of 18 <sup>th</sup> WG Meeting ( Thermal Power Group) | 04/Sep/2012 |
| 4. | Minutes of 19 <sup>th</sup> WG Meeting ( Thermal Power Group) | 05/Sep/2012 |
| 5. | Minutes of 20 <sup>th</sup> WG Meeting ( Thermal Power Group) | 23/Oct/2012 |
| 6. | Minutes of 21 <sup>st</sup> WG Meeting ( Thermal Power Group) | 22/Jan/2013 |
| 7. | Minutes of 22 <sup>nd</sup> WG Meeting ( Thermal Power Group) | 28/Jan/2013 |
| 8. | Minutes of 23 <sup>rd</sup> WG Meeting ( Thermal Power Group) | 18/Apr/2013 |

### 1. Minutes of 16<sup>th</sup> WG Meeting (Thermal Power Group)

|                         |      |   |
|-------------------------|------|---|
| Date and Time:          |      | 23/Aug/2012 14:50~17:10   |
| Vietnamese Counterpart: |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:                  |      | 207 Meeting room (2F) at MOIT   |
| Participants:           | MOIT | Mr. Cuong   |
|                         | EVN  | Mr. Thong, Ms. Hien   |
|                         | ETC1 | Mr. Yen, Mr. Truong   |
|                         | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu   |

#### Contents

#### 1. Today's agenda

##### (1) Schedule of 8<sup>th</sup> Mission

- 1) JICA explained the purpose of this Mission to the Vietnamese participants. In the rules of MOIT, IE is not a formal member of this WG and EVN is only a formal member. However, MOIT has arranged meeting to exchange opinions between JICA and other parties directly. (Mr. Cuong)
- 2) The formal WG must be the three days of 27/Aug, 4/Sept, 5/Sept which Mr. Long can participate as provided in the meeting schedule. We regard that WG is the meeting to determine and settle agreement officially. The meeting with the new parties such as IE, PV-Power, Vinacomin-Power and VTA has been scheduled as the chance to hear opinions. We believe that it must be the opportunity to consult widely any opinions and idea of relevant parties involved in the electricity business against the technical regulations and guidelines. (Mr. Koga)
- 3) We hope direct opinions, since the meeting with EVN and JICA is arranged. (Mr. Koga)

#### 2. Status of guideline Draft

- (1) The 2<sup>nd</sup> draft of guideline Vol.2 and 1<sup>st</sup> draft of guideline Vol.4 & 5 should have been distributed in printed books and CD-ROM in both EN and VN. (Mr. Koga)
- (2) We have prepared the comment table which aggregating comments up to Ver.3 that MOIT collected and submitted us and adding JICA opinion in it. , Apart from that, we have prepared the comment table that EVN had aggregated comments for Vol.2 and adding JICA opinion. We have reflected what we can reflect. (Mr. Koga)
- (3) We want to understand as much as possible how much comment comes out in future during this Mission. (Mr. Koga)

### 3. The conference material

- (1) JICA should prepare conference materials in printed Vietnamese version. (Mr. Cuong)
- (2) The Vietnamese version should be already submitted to Mr. Cuong by e-mail. It must be asked to Mr. Nakamura, if the hard copy is required. (Mr. Koga)
- (3) It is no use providing many versions from the reason that material which containing English are not available. It is better to use appropriate mixed version in the joint project, since interpreter is arranged. (Mr. Koga)
- (4) Although I can understand that English is the common language of both sides, I want JICA to prepare the Vietnamese version in order to promote the meeting efficiently. Materials used by the JICA side does not matter whatever any kind of language is used. I told Mr. Nakamura to provide all conference materials written in Vietnamese, and the Vietnamese version is used in other teams. (Mr. Cuong)
- (5) We cannot understand the content, if they were the full Vietnamese version. We have problem, if the column of conclusion is written in Vietnamese without written English in at least the conclusion column. We also need to establish a number of materials with the same content. The comment tables become long. (Mr. Koga)
- (6) I agree with you. Conclusion of the meeting will be provided all in English. (Mr. Cuong)
- (7) The Comment tables from EVN are sent to JICA after translating into English version. It is much problem for us, since comment table from MOIT is sent in raw state. We think that the arrangement and translation must be done by MOIT. Cooperation during discussion is necessary, since JICA has been also working in cooperation. (Mr. Koga)
- (8) I understand that English is a common for both sides. However, I want to prepare materials in Vietnamese in order to improve the efficiency of the meeting. (Mr. Cuong)
- (9) Of course, the final conclusion about comment table will be concluded in WG and translated into Vietnamese. (Mr. Koga)
- (10) We can be practical about the work of Mr. Nakamura and ETC1 to establish a Vietnamese version. However, it is annoying for us to establish the original version, mixed version for explanation and Vietnamese full version at once. (Mr. Koga)
- (11) I propose to JICA explain by mixed version and we read and understand by Vietnamese full version. (Mr. Cuong)
- (12) Ms. Hien sent us comment table in the English version. The comment table from MOIT is only Vietnamese version without kindness. (Mr. Koga)
- (13) We want ask you to request Mr. Nakamura due to only printing problem, since we cannot grasp the number. We would like to proceed by comment table which we provided. (Mr. Koga)

#### 4. Current status of comment table

- (1) JICA received comment table from MOIT 3 times and have returned our opinion to them. The other comment table for Vol.2 from EVN. It is much problem for us, since comment table from MOIT is sent without arrangement. We have responded with conclusion that the reasonable comment to be reflected and the unreasonable one to be un-reflected. (Mr. Koga)
- (2) If comments from EVN are the same as the MOIT, it is not listed in the comment table from MOIT. (Mr. Cuong)
- (3) In general, even if the content is same, a person who has a comment is described. (Mr. Koga)
- (4) We want to avoid vague comment which is not capable to know pointing where or what, if possible. It is necessary to reconfirm list up in the common table and describe clearly. We want reconfirming to unify the style, described clearly. (Mr. Koga)
- (5) Many people do not submit comments in the common table, though I asked to submit according common rule and form. (Mr. Cuong)
- (6) We try to confirm as much as possible, since there is enough time, though same situation as MOIT. (Ms. Hien)
- (7) It is impossible to handle general matters which cannot be understood what they say. (Mr. Koga)
- (8) I would like to hear the opinions of new parties involved in the power sector. I would confirm the direction of technical regulation and guideline being establishing whether good or wrong. (Mr. Koga)
- (9) Maybe, I think the direction is not depart from those Vietnamese is aiming for. I want JICA to finish by healing opinions from parties. I want you to reflect it in a constructive manner. It is not felt that the answer "No action" from JICA is not constructive. The hydropower team responds immediately. (Mr. Thong)
- (10) There are (1) matters related to the main frame which we cannot change, (2) matters which must be considered and (3) matters which must be changed immediately. We are not going to change easily and immediately as all comments because comments have been presented, since we established advisedly. We say the conclusion straightly, If we think the conclusion as an engineer. (Mr. Koga)
- (11) We are not going to adjust opinions if we heard opinions from parties because we are not in a position to adjust with them. We think that MOIT must call them to WS to hear opinion or perform public comment to reflect opinions formally in order to reflect their opinions. (Mr. Koga)
- (12) Hearing the opinions widely is important for us, and I want to reflect to the guidelines, if appropriate. We will submit the opinions to JICA in writing which getting out from the people who gave us their opinions. (Mr. Cuong)



- (13) How is the present situation of comment of Vol.4&5? (Mr. Koga)
- (14) Although the comments have been received, Ms. Hien has begun to arrange. We want to send JICA in English version, but we do not have enough time to arrange and translate. (Mr. Thong)
- (15) We are in trouble, if the comments will be submitted in drops even after the WS. We hope to receive in one as soon as possible, if they came out with the same comment, (Mr. Koga)
- (16) I do not want to remove the contents of the existing technical standards (Vietnamese Old Norms?) as much as possible. For example, "Internal regulation that the management regulations must established in all power plants" and "Regulation of the accident report" are not in the new technical regulation. (Mr. Thong)
- (17) Mandatory regulations require managing and maintaining the power plant by implementing by administration manual is stipulated. It is the main frame of this technical regulation. The contents to be configured have been introduced as the recommendations for the Administration manual. (Mr. Koga)
- (18) I cannot understand the inspection by upper half open in steam turbine inspection, (Mr. Thong)
- (19) There are some degrees of inspection such as full open, upper half open and partial inspection in the steam turbine inspection. Owner must decide how to do the following inspections, accounting to the status of day-to-day operation. (Mr. Koga)
- (20) I want to describe in the guideline about the procedure to inspect the steam turbine along with the procedure. (Mr. Thong)
- (21) We have continued saying that we do not provide manual such as overhaul manual from the beginning of this project. (Mr. Koga)
- (22) We want to put the detailed provision in the mandatory regulations, since we are developing regulations which is suitable for the current situation of Vietnam. It is necessary to put the minimum regulation to be observed, since new generation unit will join the generation business. (Mr. Cuong)
- (23) Vietnam may have been aiming to expand investment entry into the power generation business, including overseas. The mandatory regulation prescribes the minimum requirement in order to eliminate the unsafe ones to be observed. It may be those of expensive facility and with high-performance, or it may perform the inspection multiplied by the money may be OK as long as conforming to the minimum requirement. (Mr. Koga)
- (24) The minimum requirements between said in Vietnam and one in Japan are different. (Mr. Cuong)
- (25) Minimum requirement is that "do not cause accidents or injury", and "not cause the supply disturbance to reach statewide blackout, it does not different in anywhere in the

world. (Mr. Koga)

(26) Mr. Chong may misunderstand. The technical regulation is the requirement and does not prescribe detail procedures about a matter of mandatory regulation, the procedure how to perform, though Old Norms may have been so. (Mr. Koga)

(27) It may be the common requirement rather than the requirements for each power plant. (Mr. Cuong)

(28) If detail matters are specified in the mandatory regulation, problem will occur that something new and good cannot be applied or be in compliance with mandatory standards only. It is important to avoid blank of application of mandatory matters as regulatory agency. (Mr. Koga)

(29) The law of Vietnam does not prescribe a detail thing; instead of that Circular is the law in Vietnam. (Mr. Cuong)

(30) Looking by a third party, the same kind of thing is stipulated in law, decision and decree, the positioning of each law and regulation is not clear. Though technical regulation must be pure technical regulation, other than the pure technical matters are included in it. (Mr. Koga)

(31) You should not say that there is no specific matter in the law, since law is the backbone which is located at the top of the pyramid of law and regulation. We have realized that there is difference of the legal systems of Vietnam and Japan. (Mr. Koga)

(32) Therefore, I want to put the all necessary things into the Circular after examine of the law and regulations of Vietnam. (Mr. Cuong)

(33) I want both Vietnamese version and English version as the conference material. (Mr. Cuong)

EOD

## 2. Minutes of 17<sup>th</sup> WG Meeting (Thermal Power Group)

|   |      |   |
|---|------|---|
| Date and Time:  |      | 27/Aug/2012 8:40~11:35  |
| Vietnamese Counterpart:   |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:  |      | 205 Meeting room (2F) at MOIT   |
| Participants:   | MOIT | Mr. Long  |
|   | EVN  | Mr. Thong, Ms. Hien   |
|   | ETC1 | Mr. Truong  |
|   | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu   |
| Contents  |      |   |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) Report on the results of discussing comments for Vol.2 received from EVN, on 24/Aug with the EVN.</p> <p>(2) Among the comments received from MOIT, we want to state our opinions on Vol.2 comments, and we want to discuss.</p> <p>(3) Distributed materials</p> <p>1) "Comment Table for Vol.2 Mechanical from EVN"</p> <p>2) "Comment Table on Final draft Guideline from MOIT Ver.3"</p> <p>2. Introduction of new member</p> <p>(1) Mr. Higo takes over as the successor of Mr. Ooyama.</p> <p>3. Report on the results of discussing comments for Vol.2 received from EVN (Mr. Koga)</p> <p>(1) The discussion for general part of the comment table for Vol.2 Guideline has been omitted, since they are vague and are matters relating to the positioning of mandatory regulations and voluntary standards.</p> <p>(2) We discussed only topics which the opinion JICA "No action" and we have concluded that.</p> <p>(3) As a result I reconfirmed about comment on the GT-item6, it has been cleared the compression ratio for class less than 1,500° C is already corrected to less than 30.</p> <p>(4) Some of these comments are included in 24/Aug Ver. from MOIT. They will be treated during this mission or after returning home from this mission.</p> <p>4. Discussion on Vol.2 comments from MOIT</p> <p>(1) Item 1&amp;2: Number and capacity of feed water pumps</p> |      |   |

- 1) In the technical regulations, we have prescribed to provide the water supply equipment which covers the maximum amount of evaporation of the boiler, and we recommend in the guidelines to provide at least two feed water pumps cover the maximum amount of evaporation of the boiler. 50% × 2 units, 50% × 3 units, or 100% × 2 units is the matter of choice of the Owner. In general, T-BFP 50% × 2 units + M-BFP 50% × 1 unit is often applied to large power plants. (Mr. Koga)
- 2) If it is at least 2 units, “two or more” is not proper English. Also, I ask to review this part, since the expression of English is difficult for me to understand. (Mr. Thong)
- 3) We will recheck. (Mr. Koga)

(2) Item 3: Limit of the purity of the steam

- 1) Since this item is related to water treatment system, we cannot understand that the laws and regulations related wastewater treatment mentioned to the items on the purity of steam. (Mr. Koga)
- 2) Comment says that environmental laws and regulations that have been listed in this article are alteration and not the latest revision. (Ms. Hien)
- 3) This is the mention about the Table-10 of Article 129 in technical regulations. MOIT asked to delete the laws and regulations relating to the Ministry of the Environment and has decided to have been removed in the latest version. (Mr. Koga)
- 4) As the result of reconfirmation later: It was found that Article 129 is items for environmental equipments instead of steam purity that Mr. Koga said. (Mr. Koga)

(3) Item 4&5: Update of electrical laws and regulations

- 1) Mr. Egashira will be explained electrical matters. (Mr. Koga)

(4) Item 6: Handling of equipment, which is regulated by other laws, such as vehicle, railway and mining equipment

- 1) Originally, equipments that are regulated by other laws should not be in the technical regulations for power plants. We would introduce points for the equipments in the power plant to keep in mind in the view point of safety. If it can be confirmed surely that they are regulated by other laws, the relevant portion may be removed. (Mr. Koga)
- 2) I decided to leave it. (Mr. Thong)

- (5) Item 7: Detailed design of water firefighting equipment
- 1) Fire alarms and fire extinguishing equipment should be regulated by other laws. In addition, other methods are available to, though we have introduced water sprinkler as the fire extinguishing equipment of conveyors and coal yard. It is impossible to introduce how to decide the number of spray nozzles in the guidelines, since it is too fine talk. (Mr. Koga)
  - 2) I decided to leave it. (Mr. Thong)
- (6) Item 8: Measures to prevent explosion and clogging of the silo
- 1) I ask to put the notices for clogging or wear of silo and bunker in the guideline. In Vietnam, the measures are also applied to eliminate the clogging by the compressed gas gun. (Mr. Thong)
  - 2) As consideration, we refer to gas explosion, coal dust explosion and spontaneous combustion. We also refer to lining and the cone angle of the silo and bunker. If we mention the specific measures for prevention, it will be a much volume that is it. Selection of content should have been left to us. You had better to think that generally the perfect measure is no existing because the condition varies depending on the situation and the type of coal to be used. Each of the power plants should have been addressed through trial and error. (Mr. Koga)
  - 3) I am also troubled sought only guidelines about solution to the problem for these individual. We advise that it doesn't mind to refer to any part as a reference to if the obsolete Old Norms is helpful. (Mr. Koga)
  - 4) If possible, I want the guidelines to keep the level of guideline as Old Norms which has the legal value. (Mr. Thong)
  - 5) We think there is a legal value to the technical regulations and administration manuals, and is not in the guidelines. It is necessary to regard that it is not able to operate the power plant if there is no administration manual. You should consider that the guidelines are the reference to establish the administration manual. (Mr. Koga)
  - 6) I decided to leave it. (Mr. Thong)
- (7) Item 9: Detailed design of conveyors
- 1) We think that Owner should directly discuss such matters relating to detailed design with the manufacture, because JICA expert is not the manufacture. Perhaps, Owner own should never design conveyor equipment. (Mr. Koga)
  - 2) I decided to leave it. (Mr. Thong)

- (8) Item 10: Detailed design of coal mill
- 1) We think that Owner should directly discuss such matters relating to detailed design with the manufacture, because JICA expert is not the manufacture. Perhaps, Owner own should never design coal mill. It is supposed that EPC Contractor will deliver the best ones as boiler accessory equipment. (Mr. Koga)
  - 2) Is it a negative pressure in the mill? (Mr. Thong)
  - 3) The pressure is plus in the mill for pulverized fired boiler, negative in the boiler furnace. (Mr. Higo)
  - 4) In Vietnam, there is both plus mill and negative mill. (Ms. Hien)
  - 5) It is difficult for me to understand the contents of Article 58-4 in the technical regulation. Do you have mention about the negative pressure? (Mr. Thong)
  - 6) We would reconfirm. (Mr. Koga)
  - 7) I decided to leave it. (Mr. Thong)
- (9) Item 11: Properties of ash and design condition of ash processing facility
- 1) Basically, the guideline does not intend to describe how to design equipment. We think that Owner should directly discuss such matters relating to detailed design with the manufacture, because JICA expert is not the manufacture. Perhaps, Owner should never design coal mill. EPC Contractor is supposed to deliver the best ones as boiler accessory equipment. (Mr. Koga)
  - 2) I decided to leave it. (Mr. Thong)
- (10) Item 12: Surplus wastewater of sea ash dump
- 1) In the future, power plants that provide ash dump and landfill in the sea would come out in Vietnam. In addition to the regulation of wastewater to the sea, is there the regulation of surplus wastewater or not? (Probably there is no) We do not know, but we introduce the regulation that is managed by such voluntary standards in Japan. If you do not need as a matter Ministry of the Environment, it may be removed. (Mr. Koga)
  - 2) Currently, there are sea ash dump, there is no problem, since we manage in accordance with regulatory requirements. If there is the regulation of surplus wastewater of, let us know contrary. (Mr. Koga)
  - 3) Now, there are some places we are doing waters landfill, it has been managed in accordance with regulatory requirements. Although Nigh Son PP locates in coast, the coal ash is used in cement and remaining ash is treated land-filling. Land-filling area is reserved for the coal ash which cannot be recycled in case of EVN. For more information, you may confirm the TKP. (Ms. Hien)
  - 4) Now, there is no place where the waters landfill is conducting. (Mr. Thong)

- 5) It is necessary to pay attentions, though it is officially said that they conduct according to the rule, there may not have been properly processed if tracking. We might think about it too much as the ash handling equipment. (Mr. Koga)
- 6) We will remove, it may come out in the future, because that would be far future, (Mr. Long)

(11) Item 13: Standards of wet ash and design of ash treatment equipment

- 1) There should not be standards of wet ash and ash treatment equipment. Therefore, there is only way to treat land-filling. Has been referred to as the matters that should be noted as power plants, we think we are not in a position to consider the criteria and standards for ash. Also, we think it is outside the scope of the guidelines of the facility. (Mr. Koga)
- 2) I decided to leave it. (Mr. Long)

(12) Item 14: Standard of welding base material and welding rod

- 1) Although it is a comment that details of welding base material and welding rod have not been described, there is no space to explain detail in the guidelines. Therefore, we introduce voluntary standards as a guide to when owner need to check by himself. Originally, such standards should be introduced into TCVN after arrangement, evaluation and examination by Vietnamese standards committee. Standard and brand are different. So as not to be unkind, we have introduced standards to refer. (Mr. Koga)
- 2) It is a comment that should be put out too many, I decided to leave it. (Mr. Long)

(13) Item 15: Priorities and case studies of welding standard

- 1) We know that it is instructed to apply in order " TCVN ⇒ ISO ⇒ other reliable international standards" in Vietnam. Therefore, we introduce the relevant standards of welding such as international standards, TCVN and JIS. We have not confirmed the content of TCVN. We would never introduce unfamiliar standards such as Russia, France and China. Evaluation of applicable voluntary standard in Vietnam is not our work but the one of Vietnam National Standards Committee. International standards must be incorporated into TCVN after survey and examine on regular basis. (Mr. Koga)
- 2) I decided to leave it. (Mr. Long)

5. Others

- (1) It is no sense to collect comments, if the response to the parties is only "No action" against them. We want to reflect as much as possible. (Mr. Long)

- (2) We have concluded that the comments from EVN to be almost reflected. We have been created the technical regulations and guidelines with careful consideration over a long time answer such as "No action" may be abrupt in Vietnam. We want you that we do not reflect anything because there was a comment. It will become an opportunity to discuss with each other, to understand the positioning of new technical regulations and guidelines by means of expressing opinion against to the comment. We are not, contractor subcontractor and printing companies who creating technical regulations, so do not reflect all the comments. However, if it is judged that the content of comment is specific and correct as an engineer, it will be corrected immediately. (Mr. Koga)
- (3) It is not necessary prescribe the existing laws and regulations, since only they applying. (Mr. Long)
- (4) We pay many attentions to hear, because what regulatory agencies will hope and what the power generation units hope may be different. (Mr. Koga)
- (5) We want to take over the past history to the successor without problem, though there is no way that the members are replaced. (Mr. Long)

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### 3. Minutes of 18<sup>th</sup> WG Meeting (Thermal Power Group)

|  |      |   |
|--|------|---|
| Date and Time:   |      | 4/Sept/2012 14:05~16:30   |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:   |      | 204 Meeting room at MOIT  |
| Participants   | MOIT | Mr. Long  |
|  | EVN  | Mr. Thong, Ms. Hien   |
|  | ETC1 | Mr. Truong  |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Egashira (Electrical)<br>Interpreter: Ms. Thu                |
| Contents   |      |   |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) Discussion about issues which is obtained through discussion with parties and opinions against them</p> <p>(2) Progress report of comment treatment on this mission</p> <p>(3) Practices of supporting project</p> <p>(4) Discussion of pending general items (if there were time)</p> <p>(5) Distributed new materials</p> <p>    1) Agenda for 18<sup>th</sup> and 19<sup>th</sup> WG meeting</p> <p>2. Contents of discussion</p> <p>(1) Discussion about issues which is obtained through discussion with parties and opinions against them</p> <p>    1) Interview result about positioning and role of mandatory regulation and voluntary standard (Mr. Koga)</p> <p>        ➤ It has been found that there are three major parties.</p> <p>        ➤ It has been found that there is a difference in the demand content of mandatory regulation.</p> <p>    2) The scope of work for development of technical regulation and guideline</p> <p>        ➤ Guideline is only guiding or guidance, it is not intend to provide what can be used in day-to-day operations of power plant immediately. From this view point, Vietnam side must understand that there is a limit to the quality and quantity to be provided. (Mr. Koga)</p> |      |   |

- The technical regulation is almost completed. It is not necessary to provide finer things such as manual level in the guideline. The future work may be about reinforcement of data like the reinforcement of what the contents of the item which is in the regulation, since we have not much remaining time. There is no need to put in new ones at all. (Mr. Long)
- We don't describe the information of individual manufacturer. We limit to general matters. (Mr. Egashira)
- I agree. (Mr. Long)
- I hope JICA to continue discussion about comments from Vietnam. I hope to hear opinions from many peoples, coordinate and reflect them. (Mr. Long)
- The simple comment is easy to fix. However, it is necessary to realize that all comments can not necessarily be reflected, since there are opinions to the contrary. (Mr. Koga)
- There is no possibility to leach agreement necessarily, though we will continue to hear opinions from EVN or others through comment treatment process as before. The final decision for the remaining items would be carried out by JICA. For example, some people say that Vol.2 mechanical guideline is too thick to read, on the other hand other people says should be more enriched. Such judgment must be carried out by JICA who is establisher. (Mr. Koga)
- It may be all "No action", if JICA will determine all. The coordination with each party before JICA decide is desirable. (Mr. Long)
- In principle, all comments must be aggregated by MOIT. Mr. Nakamura claimed us so as not collect comments with bypass. MOIT must organize and summarize in the process of aggregation. (Mr. Koga)
- The bypass is never the formal rule, while we have been accepted comment to bypass from EVN because there is impact to our work. (Mr. Koga)
- It must be conform to the formal rule eventually. (Mr. Long)
- There are comments which we cannot understand what commentator says. It is necessary to perform such work to confirm the intention of the comments in Vietnam side. In some cases in WG, there is opinion that it cannot afford an opinion because it has not issued by WG member. How do you think about the proposal that JICA will decide whether to be reflected or not. (Mr. Koga)
- It is in trouble, if same as until now. Improvement is required more than now. We must settle pending comments, if comments are left without agreement. JICA would judge how to deal with them voluntarily, if MOIT cannot agree with us. The indecisive issues will remain in case of such matters to the contrary; we hope that all comments which have been issued will never be

fully reflected. We cannot reflect the opinion of only one party, since us JICA expert is not a representative of the interests. They will be determined based on the conscience of the engineer. (Mr. Koga)

- It would not be desirable, though we JICA expert can request MOIT the official answer of this matter in writing through JICA. (Mr. Koga)
- There was no clear answer on this matter from Mr. Long. (Mr. Koga)
- I want to continue same way of as before. (Mr. Long)

3) Difference in understanding of technical regulation as law and regulation

- JICA contribute the only pure technical scope. MOIT as regulatory agency must aim to regulate comprehensive technical regulation which MOIT hopes in accordance with the actual situation of Vietnam taking in the pure technical regulation which we contribute. (Mr. Koga)
- The only pure technical scope is acceptable. This matter will be responded as the common issue throughout all groups. (Mr. Long)

4) Problem on application of mandatory regulation

- It is questionable whether there is proof that even with a mandatory regulation is operated correctly. JICA would MOIT to consider the system that mandatory regulation can be operated successfully. (Mr. Koga)

(2) Progress report of comment treatment on this mission

1) Comment table Ver.3 from MOIT (Mr. Koga)

- Comments for Vol.2 and Vol.5 have been concluded through discussion with EVN.
- Comments for Vol.4 (General matters) are necessary to discuss with MOIT, since they are pending.

2) Additional comment dated 24/Aug (Mr. Koga)

- SCADA/EMS and control equipment have been discussed with EVN.
- JICA opinion against additional comments for Vol.2, 4 and 5 will be responded after this mission.

(3) Practices of supporting project

1) Appearance of deliverables

- Our duty of JICA expert is to contribute the recommendation limiting to the pure technical scope in English draft. We never press it to Vietnam side. We regard that the coordination, reflection of opinions from parties and finish to

the final version which Vietnam said says. (Mr. Koga)

- We understand that the adjustment, reflection of opinions from parties and finish to the final version which Vietnam side says. (Mr. Long)

2) Schedule of finalization for technical regulation and guideline

- All comments must be issued by the end of November. (Mr. Higo)
- Comments should continue to be received until the end of December. We propose to close the receipt of comments at the end of December and discuss about them in WG on January. Comment from outside will be closed by the end of December and further comments will be limited only from MOIT. Vietnam side is responsible for the draft after receipt of it on March. (Mr. Long)
- As a result of the discussion, it was decided that all final comments must be received by Mr. Nakamura no later than 20/Dec. (Mr. Long) (Mr. Higo)
- All comments must be summarized in the comment table by MOIT and submitted to Mr. Nakamura, and comments from EVN must not send directly, according to the instruction of Mr. Nakamura. (Mr. Koga)

(4) Discussion about pending general items

- 1) These are carried over to the next day due to lack of time. (Mr. Koga)

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#### 4. Minutes of 19<sup>th</sup> WG Meeting (Thermal Power Group)

|  |      |   |
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| Date and Time:   |      | 5/Sept/2012 14:05~17:45   |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:   |      | 206 Meeting room (2F) at MOIT   |
| Participants:  | MOIT | Mr. Cuong   |
|  | EVN  | Ms. Hien  |
|  | ETC1 | Mr. Truong  |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Egashira (Electrical)<br>Interpreter: Ms. Ha                 |
| Contents   |      |   |
| <p>1. Today's agenda (Mr. Higo)</p> <p>(1) Summary report of meeting result on 4/Sept</p> <p>(2) Discussion about Vol.4 general, Vol.5, Vol.2 general from MOIT, general comments for Vol.2 from EVN</p> <p>2. Contents of discussion</p> <p>(1) Summary report of meeting result on 4/Sept</p> <p>1) The scope of regulation and guideline which JICA will establish may be a pure technical scope.</p> <p>2) The final comments must be submitted to Mr. Nakamura by 20/Dec/2012.</p> <p>(2) About general comments for Vol.5 on Ver.4 from MOIT</p> <p>1) Item-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12: Supplement of management and control matters relating performance, efficiency, economy and the like</p> <p>➤ JICA is responsible to contribute the only minimum and pure technical regulation for safety. Further scope must be established by MOIT. Therefore, we don't perform supplement and correction against general comments from MOIT. (Mr. Higo)</p> <p>➤ Have not such matters provided in both technical regulations and guidelines? (Mr. Cuong)</p> <p>➤ We have not provided such matters. (Mr. Higo)</p> <p>➤ We hope to provide numbers which may be helpful from the experience of JICA. We consider by ourselves how to use them. (Mr. Cuong)</p> |      |   |

- Performance data will vary day by day. We cannot realize real purpose of it, it is better if safety. (Mr. Koga)
- We hope to provide number as information in the voluntary guideline to grasp that performance is in the degree of technical advancements. (Mr. Cuong)
- Such matters must be specified in the EPC Contract, though we have provided a little in the guideline. (Mr. Koga)
- It should be Owner instead of the state who is interested in the performance of such equipment. The state must not interfere with generation units by requiring performance. (Mr. Koga)
- It is no need to discard existing safety one, though it does not care the policy to introduce one with good performance. The state must not interfere with generation units by requiring performance. (Mr. Koga)
- We agree to the idea of JICA, however, it is no need to worry about, since the new technical regulation will be applied to the new plants. (Mr. Cuong)
- We understand that the technical regulations and guidelines for Vol.4&5 will be applied to new power plant and existing power plant. (Mr. Higo)
- We do not care that the instruction are issued by state under top-down style in Vietnam, however, we intended to provide only to the extent of pure technical scope. (Mr. Koga)
- Vietnamese law is effective since the time that the technical regulation have been promulgated. (Mr. Cuong)
- It is general principle in any countries; the law should not be retroactive to the past. However, Mr. Long said that Vol.4&5 will be applied to also existing plants. Vol.2 is prescribed clearly that new regulation will be applied to only new plants after promulgation. (Mr. Koga)
- I will confirm to Mr. Long, since it seems that Mr. Long is misunderstanding. (Mr. Cuong)
- We would ask Mr. Cuong to recognize that MOIT is responsible to finish the only regulation which Mr. Cuong says as Vietnamese style comprehensive regulation by means of adding necessary matters to technical regulations that we provide. (Mr. Koga)
- I agree. However, I hope JICA to provide information based on the valuable experience, since this is the joint project. JICA may advise to the comments of Vol.4. (Mr. Cuong)
- It is the principle to operate power plant according to the recommendation of manufacturer rather than those by the third party. Matters mentioned in general comments for Vol.4 must be obtained from manufacturer at the time of purchase. (Mr. Koga)

- I ask to provide a reference sample of the necessary information when purchasing facilities. (Mr. Cuong)
- Such things must not be prescribed before purchasing facility, since such information will be obsolete in a short time. In addition, such items should be the most sensitive matter for the generating units. Owner must research information by means of obtaining catalogs by themselves and discussing with manufacturer or supplier individually when purchasing power facility. (Mr. Higo)
- We have to issue instruction so that each unit of power plant can be operated efficiently after commercial operation, though I understand it. (Mr. Cuong)
- Mr. Cuong might be misunderstanding that the guideline is the detailed regulation of mandatory regulation. Guidelines are guidance document and guide on the administrative in order to utilize the technical regulation. It introduces interpretation and shows example. (Mr. Koga)
- As the sample of GT, the performance improvement due to improved gas temperature has been introduced as a general matter. As the sample of ST, the performance improvement due to improved steam temperature has been introduced as a general matter. It is no need to seek only high performance. Price, track records and other factors are also important. (Mr. Koga)
- MOIT want to show the number which would be helpful to EVN. (Mr. Cuong)
- It is no need to despise generating unit. You should regard that EVN and PV-Power is researching by them and they have ability to investigate. (Mr. Koga)
- The information will become obsolete in within 1~2 years if we also consultant fail to collect. It is necessary to examine always by ourselves after all. (Mr. Higo)
- It is understandable that bureaucracy and generating unit who has no experience have not enough information. (Mr. Koga)
- The real information cannot be obtained from the manufacturer except by Owner who is willing to purchase equipment. (Mr. Higo)
- A person with authority to make decisions does not decide based on the information that are collected by themselves but based on the instruction from the government office. Therefore, it is necessary to show required matters in the mandatory regulation. (Mr. Cuong)
- There is no public standard that was defined plant efficiency. There would be no meaning, even those of Japan to introduce to Vietnam. (Mr. Egashira)
- I advise that it is the big problem if it is impossible to decide without advice from someone or any paper which is written by someone. Vietnam also must

change the way to determine the things taking risks in future. On the other hand, the state must not interfere with it. (Mr. Koga)

- I think that we will change gradually. (Mr. Cuong)
- The speed of technology innovation is much different compared with the childhood of Koga that there was no information, since there is rich information at present. It is required the reformation of decision-making process for Vietnam in order to take advantage of acquisition of information which there are many in a short time with speed. (Mr. Koga)
- I want to conclude “No action” as it is, since JICA regards there is no need to change against comments for Vol.4 general. (Mr. Koga)
- We want any information for inspection items or indicators to evaluate the operation of power plant. (Mr. Cuong)
- We have already introduced ASME standard for performance test which is regarding test method and evaluation method of steam plant performance and how to calculate plant efficiency of power plant in the guideline. People who want to know the detail content should buy a standard body and read carefully. Such requests should be asked to president of VTA or Vietnam standard association as the matter of maintenance, introduction and fulfillment of TCVN rather than to ask guidelines. (Mr. Koga)
- I want to conclude “No action” as it is limiting to minimum technical requirement for security and safety, since JICA regards there is no need to change. (Mr. Higo)
- We want any information against the comment from Vietnam side, even if we do not put them into guideline. (Mr. Cuong)
- The individual power plant must be performed operation and maintenance properly according to the method recommended by the manufacturer, otherwise it is dangerous and it does not become part of their property. (Mr. Koga)
- We want any information for inspection items or indicators to evaluate power plant whether it is managed and operated properly. (Mr. Cuong)
- Owner who has no technology will just invest; amateur Owner should never carry out the operation and maintenance. In fact, the operation and maintenance should be entrusted to the Operation Company or Management Company with practical skills. (Mr. Koga)
- You may carry out inspection by permanent organization of the state, if you are worried about whether O&M is being carried out accurately. You should prescribe only “MOIT is able to conduct on-site inspections without prior notice. And MOIT can instruct to stop power facility, when necessary items have not been carried out.”, if it is very. It may order to stop and improve



power facility, since it is easy to find out any problems by on-site inspection by a small number of inspectors in case the power plant which has many trouble stop or accidents. That should be an incentive so as not to cut corners. (Mr. Koga)

- We have trouble with the new Chinese power facility, since it does not be provided O&M Manual. (Mr. Cuong)
- It is a matter how to purchase. Because the purchase contract that O&M Manual must be supplied with facility prescribing necessary items has not been properly. (Mr. Koga)
- Owner who has no experience will grab defective, though there is no problem for experienced Owner. Therefore, any index will be necessary. (Mr. Cuong)
- The indicator for evaluation that there are a lot of troubles and electricity is not sold as a result it is the final index. (Mr. Koga)
- We provided the recommendation which should be put in the administration manual what is necessary to manage. It is only to check by on-site inspection whether the administration manual is established, managed and control properly or not. (Mr. Higo)
- We want know what we should do in a position to manage. (Mr. Cuong)
- If an incident reporting system or statistical reporting system has established, the state can become to grasp the actual operation and management status of each power plant naturally. The power plant or director of PP will be in trouble, if such system is enhanced. If the state intend to manage severely, then the treatment will be severe, if such stringent measure is not along with the Vietnamese culture, it means that such management is titular. (Mr. Koga)
- In Japan, the accident report system has been severely operated. If the production report, it has been controlled over the company as a business matter without even being told from the state, since the generating units are the private sector. (Mr. Koga)
- We want know the example what should be reported in the report from power plant to parent company. (Mr. Cuong)
- We want add JICA what is necessary to supplement, though those which is no need for Vietnam can be delete from guideline. (Mr. Cuong)
- Speaking clearly, comment from Vietnamese side are said to be out-focus, since the requirement of Standard Law No.68 has not been understood and comment are not along with it. (Mr. Koga)
- There is no relation between guideline and Standard Law. (Mr. Cuong)
- We realize no legal status as Mr. Long says. However, there may be many peoples who have images that confuse the mandatory regulation and guidelines

such as the bylaws of mandatory regulation from what I found by the requirement of Vietnamese side. (Mr. Koga)

- We want JICA to understand the demands of Vietnamese side. The same comment may come out again, if the answers like this against comments. (Mr. Cuong)
- We have responded final treatment to the comment with reason and explanation. (Mr. Koga)
- For example, the simple-minded claim that JICA side would not hear what Vietnamese side say and reflect comment is terrible, when we responded “JICA would not introduce standards of Russia, China and France” against the comment that JICA should introduce standards of many other countries. We have to only saying that you should examine by principal about the relationship between JIS and other international standards. (Mr. Koga)
- I agree with you. (Mr. Cuong)
- There are conflicting opinions that guideline Vol.2 is too thick to read, further supplement is necessary and do not remove the summary section of TCVN. Work has just increased for us. In that case, “leave as it is” is become to “No action”. (Mr. Koga)
- It is better to replace “It has been already provided” instead of “No action”. (Mr. Cuong, Ms. Hien)

(3) About comments for Vol.5 on Ver.4 from MOIT

1) Item-1, 2 and 3: Comment about translation

- JICA expert do not participate for quality of expression and translation into Vietnamese. (Mr. Higo)

(4) About comments for Vol.5 Electrical on Ver.4 from MOIT

1) Item-1: Proper use of “shall” and “must”

- In principle, “shall” is applied to those which are legally enforceable; “must” is applied to those which are compliance to be general rule. The review will be done in accordance with this principle, apart from the goodness or badness of “shall”, “must” and “should”. (Mr. Koga)

2) Item-2: Enhancement of reference law and regulation

- Originally, the reference standards list is provided as service. Essentially, any available standard in Vietnam must be examined, investigated, registered by Vietnam Standard Committee and introduced to TCVN. We have already introduced various standards, though it is a comment that JICA should

introduce standards of other country. We never introduce unfamiliar standard such as Russia, China and France. Therefore, it is not able to add any more.

(Mr. Koga)

- I agree what you say. (Mr. Cuong)
- There is the comment for Vol.2 stating that the Vietnamese part of TCVN summary should be translated into English from the view point of the uniformity. Kindness becomes the disservice. It would have been insufficient spirit to buy a standard by him and peruse. We would reduce total pages, since there is a comment that it is too thick to read. If the reason is only consistency, we want to delete the summary part of international; JIS and TCVN standard, since we don't want spend useless effort. JICA expert is not the not the publisher, contractor or subcontractor. We want to delete the summary column of international standard, JIS and TCVN, since we do not want spent useless effort. (Mr. Koga)

3) Item-3: Classification of requirements by output

- In principle, the requirement on the security and safety does not vary depending on the output. It is the comments that come out by the reason that the meaning of separation of mandatory and voluntary, performance requirement type regulation has still not been understood. (Mr. Koga)
- Isn't the general comment involved in other parts? (Mr. Cuong)
- It may respond by other parts. MOIT should organize parts where the comment submitted for. (Mr. Koga)

4) Item-4: The comment that there is no concreteness on Vol.4&5.

- This item was not discussed.

5) Item-5: The cryptic comment.

- This item was not discussed.

6) Item-6: Equipment standards that are required by other laws

- It is not appropriate to put the facility which is regulated by other laws in the power generation equipment from the theory of law principles. However, request issued from the Vietnam to JICA initially included a range of other facility regulated by other laws; therefore draft has been established and proposed accordingly. We want Vietnam side to organize from our draft, since those requested by the generating unit and regulatory agency might be different. It may be easy to pull out from large bag, since we have proposed in

the large bag now. (Mr. Koga)

- In such discussions, it does not reach a conclusion. (Mr. Cuong)
- The work which Mr. Cuong hopes is different from one which we were asked. JICA expert would make final decision when opinion becomes parallel, since we established draft with the maximum careful consideration. (Mr. Koga)
- MOIT will judge. (Mr. Cuong)
- Our sponsor is JICA, and JICA expert are not contractor or subcontractor of MOIT. (Mr. Koga)
- If we cannot reach agreement, the final decision will be held. (Ms.Hien)
- It is not called the consultation to reflect what is said anything. You don't think that all comments which came out will be reflected immediately. (Mr. Koga)
- We realized that the demand of Vietnam side has not been unified through this mission. Therefore, we believe that it is necessary to make final decision by JICA along with the basic policy of JICA. No agreement means that it is necessary to reconsider well the propriety of comment by Vietnam side again. (Mr. Koga)
- There is no objection to be added or deleted for draft by Vietnam side after hand over for those that does not reach an agreement. (Mr. Higo)
- I feel there are many items that are not agreed only in thermal team. (Mr. Cuong)
- I don't feel much. I feel that people of Vietnam have not read the draft well. (Mr. Koga)
- The guideline is intended to refer the content that will be helpful or to pick up and use, though it is often heard that "application of guideline" or "scope of application of guideline". It is likely to be misunderstood as the mandatory detailed regulation as the mandatory regulation is applied to all criteria. (Mr. Koga)

(5) About general comments for Vol.2 on Ver.4 from EVN

1) Item-1, 2 : "Application" of guideline

- The guideline is intended to refer the content that will be helpful or to pick up and use, though it is often heard that "application of guideline" or "scope of application of guideline". It is likely to be misunderstood as the mandatory detailed regulation as the mandatory regulation is applied to all criteria. (Mr. Koga)
- There are peoples who don't understand the difference between technical regulation and voluntary standard. (Mr. Cuong)

2) Item-3: Application of voluntary standard

- There is something wrong that MOC regulates matters of MOIT, though it seems that comment says “the application of voluntary standard must be conformed to the instruction of MOC”. JICA expert are not familiar with such specific regulation of Vietnam. It is a matter to be considered by MOIT how to use voluntary standard. It must be resolved by Vietnam side, since it belongs to the law and regulation of Vietnam. (Mr. Koga)
- It may be submitted such comment, since there is any standard related to MOC. The intention of commentator will be reconfirmed. (Ms. Hien)
- We just have introduced JIS standard, we don’t say whether it may be used or not. It should be that the standard of major countries are available without reserve, otherwise it is evaluated separately for each project, however, we don’t know where has been prescribed. (Mr. Koga)
- We want JICA to examine and correspond, since the work to provide one that fits to Vietnam is the work of JICA. (Mr. Cuong)
- We have already introduced. Essentially, TCVN must be examined by Vietnam side under the joint project. (Mr. Koga)

3) Item-4: Translation to English of the summary column of TCVN

- There is the comment for Vol.2 stating that the Vietnamese part of TCVN summary should be translated into English from the view point of the uniformity. Kindness becomes the disservice. It would have been insufficient spirit to buy a standard by him and peruse. We would reduce total pages, since there is a comment that it is too thick to read. If the reason is only consistency, we want to delete the summary part of international; JIS and TCVN standard, since we don’t want spend useless effort. JICA expert is not the not the publisher, contractor or subcontractor. We want to delete the summary column of international standard, JIS and TCVN, since we do not want spent useless effort. (Mr. Koga)
- We have provided including summary as service, where it may be only a title. We don’t want useless hassle when considering that providing summary at beginning and newly translation into English. Either way, there is no Vietnamese people should read the English version, Vietnamese should read only read Vietnamese version. We don’t want to put out like this shameful comments, though there was also an opinion to establish both in English and Vietnamese. (Mr. Koga)
- Hold it. (Ms. Hien)

- It is better to be adjusted by MOIT. I have just provided TCVN in Vietnamese in the same category with other international standards as a service. It is information that can be seen by everyone in the database of TCVN. JICA will delete the summary section. (Mr. Koga)

4) Item-5: Compatible arrangement, structure and layout

- JICA expert are not the publisher, contractor or subcontractor who is contracting the establishment of technical standard, but in a position to provide the recommendations in the pure technical aspect of technical regulation and guideline. Vietnamese side must decide the content, structure layout in consideration with the demand from Vietnam side. Content proofreading and format of draft is left to JICA. The work to conform to the law-style and bureaucratic style must be performed by Vietnam side. (Mr. Koga)
- I agree what you say. (Mr. Cuong)

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### 5. Minutes of 20<sup>th</sup> WG Meeting (Thermal Power Group)

|  |      |   |
|--|------|---|
| Date and Time:   |      | 23/Oct/2012 10:10~11:10   |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:   |      | 204 Meeting room (2F) at MOIT   |
| Participants:  | MOIT | Mr. Cuong   |
|  | EVN  | Mr. Thong   |
|  | ETC1 | Mr. Yen   |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Imamura (Electrical)<br>Interpreter: Ms. Hai                 |
| Contents   |      |   |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) About comments ver. 5 from MOIT</p> <p>(2) Practice of 3<sup>rd</sup> Work Shop</p> <p>2. Contents of discussion</p> <p>(1) About comments ver. 5 from MOIT</p> <p>1) The respond sheet to the comment ver.5 for technical regulation is not respond but the recommendation from JICA, since the technical regulation has been handed over to MOIT. Therefore, it is preferable to modify or reflect them in the process of promulgation by MOIT. The detail must be referred with the list. (Mr. Koga)</p> <p>2) There is not much comments ver.5 for guideline vol.2, 4, and 5. We would propose and conclude as attached list, some will be modified and others will be left as it is. For example, item-1 is concluded "EN version will not revised, since EV version is correct and VN version is incorrect". (Mr. Koga)</p> <p>3) <i>Discussion by Vietnamese participants.(Mr. Cuong and others)</i></p> <p>4) Most of the comments are translation matter as the result of checking all comments. (Mr. Koga)</p> <p>5) The technical comments might come out in the future, although it seems to be in so far. (Mr. Cuong)</p> <p>6) I don't think that many comments will come out in future, in the present situation. (Mr. Koga)</p> <p>(2) Practice of 3<sup>rd</sup> Work Shop</p> |      |   |

- 1) I agree with the practice of WS. I ask JICA to introduce the history from the specification type provision to the performance type provision in Japan and application of general safety requirement for participants. (Mr. Cuong)
- 2) The time is limited in this WS, though it is possible to introduce them. (Mr. Koga)
- 3) I want compare how the Japanese technical regulation system is functioned. Of course, I understand such system is the latest one. (Mr. Cuong)
- 4) However, MOST of Vietnam ought to require for all ministries to classify by Standard law No.68 the mandatory regulation and voluntary standard from old norm to new system. (Mr. Koga)
- 5) The requirement of Standard law No.68 of Vietnam and the system of Japanese technical regulation for generation business is very similar. (Mr. Cuong)
- 6) On the contrary, because both are conformed to the global standards. Long time ago, the state of Japan required detail matter under the same system of the specification type regulation as Vietnam. Japan changed the system to conform the global standard as same as Standard law No.68 of Vietnam. It is quite similar. It is possible to introduce the system of Japanese technical regulation by sample. (Mr. Koga)
- 7) What is the advantage and disadvantage, when applying it? (Mr. Cuong)
- 8) We have already explained it many times. (Mr. Koga)
- 9) However, we have not understood it. (Mr. Cuong)
- 10) I can explain the difference between one of Vietnamese and Japanese and history by a simple diagram. (Mr. Koga)
- 11) I ask to explain it for the participants of WS, though it does not matter. (Mr. Cuong)
- 12) Then the main point about roles in WS, JICA would not explain details of each article of guideline. Moreover, we avoid replying to the comments from EVN and their party, since the scope is wide and time is limited as much as possible. We would ask Mr. Long the facilitator or moderator. However, we would support Mr. Long so as not embarrass. (Mr. Koga)
- 13) *Discussion by Vietnamese participants.*
- 14) The technical regulation is very important than the guideline, though we cannot discuss the detail of each article of guideline this time. It is better to discuss about allocation of time in WS for the technical regulation and guideline. Have you discussed much about the technical regulation in last WS2 on 6/2011? (Mr. Cuong)
- 15) We have not discussed much about the pre-draft of technical regulation in WS2. (Mr. Koga)
- 16) If so, it should be concentrated to discuss about the technical regulation in this WS, since the technical regulation is very important than the guideline. (Mr. Cuong)
- 17) We ask MOIT to explain the purpose directly to participants what they intend to



establish, why they intend to change both system of technical regulation and guideline, how to prescribe mandatory matters in the technical regulation. (Mr. Koga)

- 18) I ask to explain about it by JICA instead from Vietnamese side. (Mr. Cuong)
- 19) Standard law No.68 might be applied to all ministry and agencies in all over Vietnam. It is the national project of Vietnam. JICA is simply to support development of the technical regulation and guideline. (Mr. Koga)
- 20) We ask to JICA explain them, though the standard law is as it is. JICA should explain, since the development of the technical regulation and guideline is performed according to the concept of JICA. It is thought depending on the agreement of this project. (Mr. Cuong)
- 21) When establishing new law and regulation in Japan, ministry and their agency provide the guidance or guideline at the same time. (Mr. Koga)
- 22) Why these guidelines will be the supporting documentation? What kind of documentation are they? (Mr. Cuong)
- 23) The guideline is just guidance. (Mr. Koga)
- 24) Does METI want to develop it? (Mr. Cuong)
- 25) The guideline shows the sample or purpose in order to ensure smooth application of technical regulation. (Mr. Koga)
- 26) Is the guideline of Japan whether mandatory or not? (Mr. Thong)
- 27) It is not the mandatory one. (Mr. Koga)
- 28) What is the position of guideline, when it came into force? (Mr. Cuong)
- 29) If it is the legal status, the guideline is only the sample or interpretation to achieve mandatory requirement. Many peoples in Vietnam misunderstand that the guideline is the bylaw of the mandatory regulation. (Mr. Koga)
- 30) I have misunderstood it the mandatory regulation in the last meeting. (Mr. Thong)
- 31) It is not mandatory. Can we ask Mr. Long to explain that why there are mandatory regulation and voluntary parts in the new system which MOIT are intending to establish and promoting in about 30 minutes? (Mr. Koga)
- 32) Yes. (Mr. Cuong)
- 33) We have provided own questionnaire in order to confirm by ourselves in this WS, though Mr. Nakamura ask survey of satisfaction to Mr. Yen. This time, JICA will not perform detail explanation of guideline; will concentrate to confirm the degree of understanding to positioning, purpose and deference between regulation and guideline by orally. We hand over the questionnaire to Mr. Yen instead of the official questionnaire for survey of satisfaction. (Mr. Koga)
- 34) Please explain the content of questionnaire. (Mr. Yen)
- 35) We consolidated questionnaire for satisfaction and necessity and supplemented the

- item to confirm, though the format which we provided is almost same as one of ETC draft. (Mr. Koga)
- 36) I ask participants to fill-up this sheet. (Mr. Thong)
- 37) If we will prepare the format and distribute at the registration of WS, it would be fill up it during WS. (Mr. Yen)
- 38) There is not enough time to send the format. The official format must be distributed to power plant and about all scope, since we cannot query to all participants in WS. (Mr. Koga)
- 39) *They are confusing a little. (Ms. Hai)*
- 40) We ask to distribute the official questionnaire to all power plants later on. (Mr. Koga)
- 41) I propose to distribute questionnaire to only participant for thermal part and recover them after WS thermal session instead of all participants. (Mr. Cuong)
- 42) We will choose some people to confirm, since there is not enough time to reply. It is better to collect opinions and answers from all power plants written in the official questionnaire later on, since it is not impossible to confirm to all participants. MOIT is responsible to collect opinions, and JICA had better to receive it afterward. (Mr. Koga)
- 43) However, Ws is the good chance to collect opinions of all power plants for MOIT. (Mr. Cuong)
- 44) However, there is not enough time. The available time is  $1.5h(\text{each part}) \times 2 + 1h = 4h(\text{total})$ . (Mr. Koga)
- 45) Participants may fill up form during WS. (Mr. Cuong)
- 46) It is not capable to fill up it instantly, if they have not read guidelines before WS. Therefore, it is better to distribute the official questionnaire later on. Mr. Yen how do you think about it? (Mr. Koga)
- 47) We cannot agree the method how to collect opinions from power plants, though we agree that we will collect opinions from power plants, as the result of discussion between MOIT, EVN and ETC1. (Mr. Cuong)
- 48) The recovery of the official questionnaire may be done by ETC1, since Mr. Nakamura asked to perform the official research for satisfaction and necessity. However, confirmation during WS will be performed by JICA expert in order to grasp the status of understanding of technical regulation and guideline; therefore JICA thermal experts will perform it. (Mr. Koga)
- 49) We propose that JICA prepare questionnaire, MOIT distribute it participants at the registration and MOIT recover it after WS. (Mr. Cuong)
- 50) However, it may be the personal one instead of official one. (Mr. Koga)
- 51) The recommendation is as follows. We have already provided the questionnaire

which satisfaction and necessity items are consolidated. We present it to ETC, ETC1 will provide format, distribute it at the registration and will be confirmed during WS. Probably, participants will not be able to answer to all questions during WS. The official questionnaire will be recovered after WS as official answer from power plant. (Mr. Koga)

- 52) Participants may not return it to MOIT or ETC1 after completion of WS. (Mr. Cuong)
- 53) Mr. Yen, the actual collection work is the one of ETC1. (Mr. Koga)
- 54) Mr. Yen agreed that he is responsible to collect official questionnaire. However, how to pass the data to ETC exactly? (Mr. Cuong)
- 55) JICA hopes official response as organization instead of the one of participant personal. (Mr. Koga)
- 56) Probably the representative of technical division such as general manager will participate. The list of participant has already been provided. (Mr. Cuong)
- 57) Conclude as follows. JICA will provide questionnaire before WS. It will be distributed to participants at the registration. The official answer as organization must be return to ETC later on. (Mr. Koga)
- 58) JICA will not explain actively in the thermal session but would support Mr. Long who is the facilitator or moderator so as not embarrass. (Mr. Koga)

(3) Deadline of the final comments

- 1) Mr. Long and JICA have agreed that the all final comments relating thermal part must be submitted from MOIT to Mr. Nakamura by 20/12/2012 in the 8<sup>th</sup> mission. Is that correct? (Mr. Higo)
- 2) I agree to submit the final comments by 20/12/2012. (Mr. Cuong)

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### 6. Minutes of 21<sup>st</sup> WG Meeting (Thermal Power Group)

|  |      |   |
|--|------|---|
| Date and Time:   |      | 22/Jan/2013 8:40~12:00  |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:   |      | 204 Meeting room (2F) at MOIT   |
| Participants:  | MOIT | Mr. Cuong   |
|  | EVN  | Mr. Viet, Mr. Thong   |
|  | ETC1 | Mr. Anh   |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Imamura (Electrical)<br>Interpreter: Ms. Ha                  |
| Contents   |      |   |
| <p>1. Today's agenda (M. Koga)</p> <p>(1) Today's meeting is changed from full day to only morning by the circumstances of the Vietnamese participants.</p> <p>(2) The pre-final version guideline of Vol.2 has been distributed to each WG members on 10/Jan in CD-ROM. The pre-final version guidelines of Vol.4&amp;5 are handed over to each WG members today in CD-ROM.</p> <p>(3) As the result of investigation and evaluation of comments, those which have validity have been reflected and that which has no validity has not reflected. Today, we are going to confirm the JICA opinion for comment version 6&amp;7 based on the comment table which has been updated and distributed according to the WS comments and final comments. Basically, we regard only pass it as final as completed. However, we think there are many issues for the promulgation of the mandatory regulation when we think in the aspect whether they are satisfactory or not as consultant, since the development policy is not unified between Vietnamese parties. We want Vietnam side to consider well, since such matters are not capable to resolve by only comments treatment.</p> <p>(4) EVN request more detailed guideline; on the other hand VTA said that the present guideline is too thick to read. It is impossible to coordinate opinions between Vietnamese parties for JICA expert.</p> <p>2. Contents of discussion</p> <p>(1) About General items</p> <p style="padding-left: 20px;">1) To be deleted, since there is no new comment as Ver.6&amp;7.</p> <p>(2) About Vol.2 items</p> |      |   |

- 1) Almost answer for the comment from Vietnam side are “no revision”, if so it is no meaning of this meeting? (Mr. Viet)
- 2) We hope detail information and regulations relating inspection and operation including academic matters as much as possible, since EVN is responsible to site activities. (Mr. Viet)
- 3) It is impossible to coordinate all requests for JICA expert, though VTA no need academic matters and EVN hope academic matters. It is the testament that the policy of Vietnam side parties is not formulated. (Mr. Koga)
- 4) There is no difference on request between VTA and EVN. (Mr. Cuong)
- 5) Off course Mr. Cuong knows that the role of mandatory regulation and voluntary standard are defined in the WTO-TBT agreement and Standard Law No.68 instructed to develop new regulation according to them as fundamental matter as government agency? (Mr. Koga)
- 6) We understand well. The content will be considered from now by Vietnam side. (Mr. Cuong)
- 7) It is clear that the president of VTA has not understood the role of mandatory regulation and voluntary standard; because he says that the content of TCVN must be incorporated into the mandatory regulation. There are different opinions by its position. Therefore, it cannot be organized even when continuing comment processing as long as MOIT is not explicitly the development policy. (Mr. Koga)
- 8) We need detailed and concrete matter involving the implementation instead of academic ones as fundamental request for guideline. (Mr. Viet)(Mr. Cuong)
- 9) If so, it can be seen that Vietnam side misunderstand the guideline as the bylaw of mandatory regulation. It is the misunderstanding at all. We would advise clearly. The guideline is the guidance which is introduced for smooth operation of regulation by government agency as reference, where may be only the mandatory regulation originally. (Mr. Koga)
- 10) We want start discussion about the comment items, since it cannot concluded about basic policy in this WG meeting (Mr. Cuong)
- 11) There is basic difference only in the thermal group; there is no in hydro and network group. (Mr. Viet)
- 12) I advise to MOIT that the essential problems cannot be resolved without resolution of essential issues as long as continuing the comment processing. (Mr. Koga)
- 13) We realize that we are responsible for the legislation of technical regulation and guideline in line with the Vietnamese procedure. I realize that we need to establish considering the requirement of WTO-TBT, since I am in the department being in charge it. (Mr. Cuong)
- 14) We ask support to JICA, since there is no existing regulation and guideline in the

field of design. (Mr. Viet)

- 15) The planning and procurement of power plant should be conducted without existing regulation. Are there no regulation at all? (Mr. Koga)
- 16) I ask to understand and consider well that there are issues on the registration, because I pass the written advice. (Mr. Koga)
- 17) There is problem with the draft technical regulation as it stand. (Mr. Viet)
- 18) We feel uncomfortable that the proposed drafts are evaluated by the person who has no existing regulations. JICA expert cannot agree to the compliant that the all requests from EVN have not been reflected, since we are not the contractor of EVN. (Mr. Koga)
- 19) The originator of draft regulation believes that it is difficult to promulgate it as it stands. I think that it is necessary to review, supplement, delete contents and finalize to the figure which is originally requested by Vietnamese after coordination between Vietnamese parties based on the drafts. (Mr. Koga)

(3) Items of comment table Ver.6&7

- 1) I will omit general part, since there is no new comment. (Mr. Koga)
- 2) It cannot cope, since comments item-81~87 are very vague, though Mr. Viet says that comments have not reflected. (Mr. Koga)
- 3) Item-81 is the request to prescribe about the fuel storage and supply facility in detail. (Mr. Viet)
- 4) They have already been introduced in the guideline to varying the degrees. (Mr. Koga)
- 5) They are not the matters which should be prescribed in the guideline; such concrete matters must be discussed and decided between Owner and manufacture or EPC contractor. (Mr. Koga)
- 6) There is the target of 500 pages for the mechanical part of Vo.2 as the request from the project leader. It is not possible to make what is fine and has lot volume infinitely. (Mr. Koga)
- 7) Number of pages does not matter for Vietnamese side, though there may be the target in the Japanese members. (Mr. Viet)
- 8) It is impossible to correspond if there is no specific answer when conforming what to be provided. I cannot cope with request which the concrete point is vague and literally as an engineer, though you may only get anything all. (Mr. Koga)
- 9) I tell the truth of this comment, we expect to JICA, since we don't know well about the fuel storage and supply facility. (Mr. Viet)
- 10) When the power plant is going to plant and purchase, in fact, the practical planning or development of purchase specification should be requested to the consultant.

(Mr. Koga)

- 11) We would use it as criteria to evaluate whether the work implemented by consultant is satisfactory or not. (Mr. Viet)
- 12) It is necessary to research by them depending on the inspiration from reference book, since the guideline is only reference book. It is trouble that it is required only for the guideline. (Mr. Koga)
- 13) To the truth, this is just a request to introduce the reference international standard, if there is. (Mr. Thong)
- 14) API standard in case of oil fuel, and there is no standard in case of coal storage yard. (Mr. Koga)
- 15) The regulation for the coal fuel storage yard of thermal power plant in case of the imported coal with high volatile content, though it is no need to take account in case of the anthracite. It is necessary to consider about the fire-fighting facility, wastewater treatment facility and storage capacity. (Mr. Thong)
- 16) Do they regulate as the facility of the thermal power facility? Should oil be regulated by the Oil Law, flammable hazardous material by Fire-fighting Law, fire-fighting facility by regulation of ministry of police? Don't you discuss about the matter what should be regulated by other government agency without being organized including in the power facility? MOIT must consider it well. (Mr. Koga)
- 17) We ask to introduce them in the guideline for the generation facility this time, though we understand what you say. (Mr. Viet)
- 18) They have already been introduced in the guideline. (Mr. Koga)
- 19) Both MOIT and EVN want to reflect content as of this comment. (Mr. Viet)
- 20) At this moment, I would say "No" clearly. I will not increase any more, since it has become 1,300 pages at this moment, though I don't care that Vietnam side delete. (Mr. Koga)
- 21) It is not clear who issued item-82 "request to supplement the electric motor driven pump". It may be the request to supplement the expression of the electric motor driven pump, since there is no expression about the electric motor driven pump but the steam turbine driven pump. (Mr. Viet)
- 22) The feed-water facility is required in the technical regulation as mandatory requirement whatever it is a tank, electric driven pump or steam turbine driven pump and mentioned them in the guideline. (Mr. Koga)
- 23) The idea of number of spare pump is provided in this pre-final version. Please refer it. (Mr. Koga)
- 24) It is no meaning on today's meeting, if you don't reflect comments. (Mr. Viet)
- 25) It is too late at this final stage to reflect comments, though there was enough time to issue specific requests until now. We cannot correspond. (Mr. Koga)

- 26) You should not think that all comments from you will be reflected. We have said that we evaluate the validity of comments as an engineer all the way. We have reflected comments which are validity immediately. (Mr. Koga)
- 27) It is the problem, if you don't reflect comments. (Mr. Viet)
- 28) For example, it is impossible to correspond to vague comment item-83 regarding ash disposal, at least they are specific request. We have already mentioned in the guideline for ash handling facility about ash treatment of dry ash and wet ash. However, MOIT requires deleting the content regarding ash disposal from technical regulation and guideline. (Mr. Koga)
- 29) Do you know the Vietnamese regulation about white slag and wet slag? (Mr. Viet)
- 30) We heard there is no. It is the selection of Owner whether which ash treatment method to be applied or to ensure ash disposal capacity and the like. (Mr. Koga)
- 31) All ash which cannot be recycled must be used for land-filling eventually in Japan. Therefore, it is no need to design the intermediate storage of white slag. (Mr. Koga)
- 32) Vinacomin has secured seaside land-filling area. EVN hope to know the technology how to treat ash by inland processing. (Mr. Thong)
- 33) As the conclusion, we have no recommendation, since inland processing is not applied in Japan. (Mr. Koga)
- 34) We ask to reconfirm the guideline for ash treatment whether there is content what you wants know, since we provided dry and wet coal ash treatment. (Mr. Koga)
- 35) We hope to supplement the term "white slag". (Mr. Viet)
- 36) It may be added or deleted in the Vietnamese version by Vietnam side. We don't add it, since it is not the essential matter whether to supplement or not. (Mr. Koga)
- 37) Do you intend that no revision at all for the comments from now? (Mr. Viet)
- 38) I say that I cannot correspond to what is the vague request or what is something completely different from our basic development policy, though the technical mistake should be modified. (Mr. Koga)
- 39) HRSG for GTCC in comment item-84 has been discussed sometimes and the conclusion was obtained in the past. It is no need to correspond, because it comes out again. There is no difference with the heat recovery part of the circulation boiler. (Mr. Koga)
- 40) It is our conclusion that we cannot correspond to such comment, though there is the expression in the guideline for boiler and it is not read. (Mr. Koga)
- 41) I want you to misunderstand that we consultant cannot design the boiler and only manufacture such as Alstom or MHI is able to design it. If you want to know the concrete matters, you should read the standard "ASME power boiler". It is impossible to introduce the equivalent content in the guideline, so we provided the reference standards list. (Mr. Koga)



- 42) It is too late to discuss such matter at final stage. I clearly say to MOIT that we cannot correspond to such comment. (Mr. Koga)
- 43) We ask to introduce by means of extracting a part of ASME for HRSG. (Mr. Cuong)
- 44) It is not necessary to extract provisions for HRSG specifically, since there is no specific category such as HRSG and they are common with those for the power boiler. Looking at the construction of HRSG, it is common that they have drum, header and heat transfer tubes. (Mr. Koga)
- 45) Is it possible to counsel to specific problem of Mr. Thong during this mission? (Mr. Cuong)
- 46) It is possible to counsel the concrete request. (Mr. Koga)
- 47) How do you deal the essential issues which must be considered by MOIT other than comment tables? (Mr. Koga)
- 48) I will consult to JCC/JMC meeting. (Mr. Cuong)
- 49) I make it clear that we cannot correspond, even if it is concluded to make thicker or to modify than pre-final version as the result of JCC/JMC meeting. (Mr. Koga)
- 50) I understand for that matter. (Mr. Cuong)
- 51) Regarding comment item-48: “Boiler forced cooling”, there is the internal regulation in EVN and it is performed according to it. It is better to revise to avoid misunderstanding, since it is dangerous if performing according to the representation of guideline. (Mr. Thong)
- 52) Such matter should be prescribed in the administration manual of each power plant, since it is impossible to prescribe the specific matter which can be applied to all power plants as common in the guideline. It seems that you misunderstand guideline as the mandatory regulation. (Mr. Koga)
- 53) It is the principle to conform to the O&M Manual of the each manufacturer, since the cooling rate is different in each boiler manufacturer. It is not necessary to revise “after completion of boiler forced cooling stop, it must be stopped fan and feed water system”, since it is assumed that it was cooled down after appropriate time. (Mr. Higo)
- 54) Is there any case to continue operating fans after forced cooling in Japan? Isn't it dangerous? We ask to modify to “stop fans and pumps after appropriate operation”, though it is no need to prescribe operation hours. (Mr. Thong)
- 55) The sentence will be revised to “stop fans after implementation to ensure furnace purge in appropriate time, drive feed-water pump while maintaining acceptable cooling speed and stop it when temperature reached specified temperature”. (Mr. Koga)
- 56) It cannot be cooled down boiler except replacing boiler water, even if operating

only ventilation system. (Mr. Koga)

- 57) We ask to provide the assessment method for remaining life of main piping of boiler regarding Vol.5 Item-14. (Mr. Thong)
- 58) I cannot say that the metallurgical yardstick which can be recommended with confidence for Vietnam has established, though several method are under investigation. (Mr. Koga)
- 59) We know that Japan has advanced non-destructive technology. We ask to introduce micro-structure examination. (Mr. Thong)
- 60) It is more difficult to talk about the fine organization level, though non-destructive examination technology that is to find existing great scar has been developed. There is no state that can be introduced with confidence as the conscience of an engineer. (Mr. Koga)
- 61) The laboratory for remaining life assessment has been established in Vietnam. It is conducted in the power plant exceeded 100,000 operation hours. (Mr. Thong)
- 62) Is such technology developing than Japan, since there are old power plants? (Mr. Koga)
- 63) The technology that can be determined in high accuracy has not established in Japan, though it has been trying to make ruler and making examination. (Mr. Koga)
- 64) Remaining items will be discussed in the full day WG meeting on 28/Jan. (Mr. Cuong)

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### 7. Minutes of 22<sup>nd</sup> WG Meeting (Thermal Power Group)

|  |      |   |
|--|------|---|
| Date and Time:   |      | 28/Jan/2013 8:45~11:35  |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>EVN (Electricity Vietnam )<br>ETC (Electric Testing Center)                |
| Venue:   |      | 204 Meeting room (2F) at MOIT   |
| Participants:  | MOIT | Mr. Long  |
|  | EVN  | Mr. Thong   |
|  | ETC1 | Mr. Yen   |
|  | JICA | Mr. Nakamura (Project Leader)<br>Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Imamura (Electrical)<br>Interpreter: Ms. Ha |
| Contents   |      |   |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) Discussion about comment ver.6, 7 from MOIT (continued from 21<sup>st</sup> WG)</p> <p>(2) Further plans and proposal for resolution on legislation of technical regulation</p> <p>2. Discussion about comment ver.6, 7 from MOIT (continued from 21<sup>st</sup> WG)</p> <p>(1) Revised comment table ver.6, 7</p> <p>1) We distribute the VN comment table Ver.6, 7. The parts where are filled out in blue characters in Vol. 4&amp;5 are the updated ones from the comment table which is distributed on 22/Jan. The review according to the EN comment table from Mr. Yen of ETC on end of last Dec. is the reason for update. However, they are not major change. (Mr. Imamura)</p> <p>(2) Vol.4, Item-26: Fuel characteristic of Indonesian coal</p> <p>1) I have supplemented the fuel characteristic of Indonesian coal, Chinese coal and light oil in Article 102 that are requested in 3<sup>rd</sup> WS. It cannot be used for exact design, since it is just a sample. (Mr. Higo)</p> <p>2) There are many brands of Indonesian coal. Is the supplemented characteristic the standard value of Indonesian coal? (Mr. Thong)</p> <p>3) It is unknown whether it is the standard of Indonesian coal or not, since it is obtained by the literature search. The composition for design must be decided in discussion with boiler manufacturer. (Mr. Higo)</p> <p>4) There were no objections from Vietnam side.</p> |      |   |

- (3) Vol.4, Item-27-29: Coal conveyor system
- 1) I cannot be prescribed number of conveyor as same as the capacity of coal storage yard in the guideline, since it must be decided by Owner. (Mr. Higo)
  - 2) I agree that number of conveyor must be decided by Owner. (Mr. Long)
  - 3) This is the comment for Vol.2 in the comment table of Vietnamese version. It may prescribe in Vol.2, if the number of conveyor is not prescribed in Vol.4. (Mr. Thong)
  - 4) MOIT should organize whether the comment is one for which Vol. Number and capacity of conveyor must be decided by Owner to match the construction of power plant, even if it is the comment Vol.2. (Mr. Koga)
  - 5) I ask to prescribe the standard to decide number of conveyor depending on the requested capacity. (Mr. Thong)
  - 6) It cannot be unconditionally prescribed, since it depends on the type of power plant and capacity of it. (Mr. Koga)
  - 7) Isn't there any rule in Japanese or international standard about number of coal handling facility? (Mr. Thong)
  - 8) There is no rule about number and capacity of coal handling facility. (Mr. Koga)
  - 9) Is there any classification about number and capacity of coal handling facility? (Mr. Thong)
  - 10) Some information such as the calculation formula about conveyor transportation capacity is mentioned in Vol.2 "coal fuel handling facility". (Mr. Koga)
  - 11) Is the coal conveyor in Japan operated by 24h/day or 3-shift? (Mr. Thong)
  - 12) It is the shift operation. Conveyor connecting facilities such as the bunker, coal storage yard and un-loader should be designed taking into account the balance of entire facility. (Mr. Koga)
  - 13) It is waste to design the conveyor at the maximum required capacity. (Mr. Thong)
  - 14) It is necessary to consider how to implement the coal transportation or storage. As the result, it is the matter to be decided by Owner, since there is no rule to decide number of conveyor. (Mr. Koga)
  - 15) Coal conveyor between the coal storage yard and the bunker is operated by 3-shift in power plant of EVN. (Mr. Thong)
  - 16) Coal conveyor system is automated in Japan. (Mr. Koga)
  - 17) I agree. (Mr. Thong)
- (4) Vol.4, Item-30: Environmental regulation
- 1) Content of comment is vague. The water quality regulation for boiler is described in Vol.2. (Mr. Higo)
  - 2) The content of comment is requesting to consider emission regulation of hazardous

substances when there were a large number of power plants in some region. (Mr. Thong)

- 3) The environmental regulation must be decided by other ministries. (Mr. Higo)
- 4) The total emission of hazardous substances in the region will be a problem, if hazardous substances are discharged from a large number of power plants, even if the emission regulation from power plant in Vietnam is appropriate. (Mr. Thong)
- 5) How do you want to reflect in the guideline, though there are environmental regulation, emission regulation and restrictions on total amount? Currently, are there restrictions on total amount in Vietnam? (Mr. Koga)
- 6) Vietnamese law and regulation may prescribe that the environmental regulation must be secure throughout the region irrespective of the amount of emitted hazardous substances from each power plant. (Mr. Thong)
- 7) The restriction on total amount is out of scope of this project, since it is the matter of regulation of ministry of environment. Therefore, we can only advise to select appropriate facility to remove hazardous substances so as to conform to the restriction on total amount. (Mr. Koga)
- 8) Isn't there concrete method about restriction on total amount? (Mr. Thong)
- 9) It depends on the regulation by Vietnamese environment ministry. (Mr. Koga)
- 10) How much does the percentage of the emission from power plant occupy in the total amount? (Mr. Thong)
- 11) It depends on the state of the environment in the area. All factories such as steel mills in the region are the target as well as power plant. (Mr. Koga)
- 12) Does ministry of environment decide the proportion of emission amount of hazardous substances from each power plant on the basis of any criteria? (Mr. Thong)
- 13) In Japan, we may use fuel containing less source a harmful substances such as sulfur oxides. First, it is necessary to examine the content of restriction on total amount. And it is necessary to pay attention how it is become in future. (Mr. Koga)
- 14) There were no objections from Vietnam side.

(5) Vol.4, Item-31: De-NOx device

- 1) It has already mentioned in Article 186, though this is the comment to supplement about De-NOx device. In addition, the method for De-NOx is mentioned in the guideline Vol.2. (Mr. Higo)
- 2) Is the De-NOx device by the ammonia splay method introduced in the guideline Vol.2 for environmental facility? V (Mr. Thong)
- 3) It is a De-NOx reduction method which applied catalyst. Although there is no detail

description, it may be contacted to manufacture by you according to the hint described in the guideline. It is the result of taking into account the entire amount of guideline the reason why drawings of the De-NOx device. Is not provided. Because, the De-NOx device is not complicated facility which should be shown in the figure. I ask you not think that it is useless because the detailed drawings have not been provided. (Mr. Koga)

- 4) It is necessary to introduction of SOx and NOx reduction device as same as the electric precipitator. (Mr. Thong)
- 5) It is necessary to examine by their effort according to the expression about how to reduce NOx mentioned in the guideline. (Mr. Koga)
- 6) I would report after I return to the office, since this is the comment from other people. (Mr. Thong)

(6) Vol.4, Item-33-34: AH and turning oil pump

- 1) We don't supplement the operation procedure of facility, since it must be provided by Owner according to the O&M Manual from the manufacturer. (Mr. Higo)
- 2) It is no need to discuss, since this is the translation issue as mentioned in comment table. (Mr. Thong)

(7) Vol.4, Item-32: Emergency lighting

- 1) General location of the emergency lighting has been supplemented. (Mr. Imamura)
- 2) It is no need to discuss if this is revised, though I have not confirmed Pre-final draft dated 1/22 yet, since there are a lot of changes. (Mr. Thong)

(8) Vol.4, Item-35-38: Exciter and generator cooling system

- 1) These are all translation issues. (Mr. Imamura)
- 2) It may be ignored, if they are translation issue. (Mr. Thong)
- 3) I agree. (Mr. Imamura)

(9) Vol.4, Item-39: Generator operated under unbalanced load

- 1) The error in the English is corrected in the Pre-final version. (Mr. Imamura)
- 2) I agree. (Mr. Thong)

(10) Vol.4, Item-40: Operation status of electric motor

- 1) I cannot cope with this comment, since content in the comment column and solution column is same and finding is unknown. (Mr. Imamura)
- 2) This is the comment requiring replacing word "engine" in Article 261 with "prime mover". (Mr. Yen)

- 3) I don't involve in the translation issue, since there is no representation in English version. (Mr. Imamura)
- 4) I confirmed that this is a translation issue. I would make sure the person who commented. (Mr. Thong)

(11) Vol.4, Item-41-43: Generator capability curve and electric motor

- 1) The revision of representation, supplement and correction of English has been performed in the Pre-final version according to the comment. (Mr. Imamura)
- 2) I agree. (Mr. Thong)

(12) Vol.4, Item-44-47: Hydrogen production device, protection device, insulation oil and the like

- 1) These are translation matter same as item-40, though it is replied that it cannot be cope because the content of comment column and solution column are same. (Mr. Imamura)
- 2) I confirmed the comment item-44 is the translation matter. Item-45 is the request to replace the term of Article 377 "trip" into "emergency stop". (Mr. Thong)
- 3) Such content is not described in item-45 of EN comment table. I ask to replace into proper term which means "emergency stop" in the process of translation into Vietnamese. Therefore, all comments for Vietnamese version should be organized by Vietnam side, since they are translation matters. (Mr. Imamura)
- 4) I will confirm to the person who commented and inform to JICA. The further revision of VN guideline causes the revision of EN version. (Mr. Thong)
- 5) It cannot be corresponded the comment for VN version, if you send us. The correction of improper translation of Vietnamese version is the scope of work of Mr. Yen of ETC. Item-46 and 47 are the translation issue similarly. (Mr. Imamura)
- 6) There were no objections from Vietnam side.

(13) Vol.4, Item-48: Procedure of boiler forced cooling

- 1) This item has been discussed on 22/Jan. I ask to Mr. Yen reflecting updated part into CD-ROM of Pre-final version, because I send updated part based on this discussion within this week via Mr. Nakamura. (Mr. Higo)
- 2) I agree. (Mr. Yen)
- 3) It is confirmed that Mr. Long agreed above after 19).

(14) Vol.5, Item-5: Completion inspection

- 1) It seems that this is the translation matter. It is unified to use "must" in the guideline. (Mr. Higo)

2) This comment is just a matter of expression on Vietnamese. (Mr. Thong)

(15) Vol.5 Item-6: Generator rotor

- 1) It may be a translation issue. (Mr. Imamura)
- 2) There were no objections from Vietnam side.

(16) Vol.5 Item-7: Rotor wedge and rotor teeth of generator

- 1) It has been revised according to comment. (Mr. Imamura)
- 2) There were no objections from Vietnam side.

(17) Vol.5 Item-8-13: Generator and exciter

- 1) It may be a translation issue. (Mr. Imamura)
- 2) There were no objections from Vietnam side.

(18) Vol.5 Item-14: Thickness inspection of boiler tube

- 1) The method of remaining life assessment for steam turbine is supplemented in Article 162-a1. (Mr. Higo)
- 2) Is the content for inspection supplemented, since the thickness measurement is necessary for remaining life assessment of boiler tube? (Mr. Thong)
- 3) I have supplemented. (Mr. Higo)
- 4) Regarding remaining life assessment of boiler tube, there was no description about the super-heater and intermediate heating tube but the boiler connection piping in the 2<sup>nd</sup> Draft version. Pre-final version looks same as 2<sup>nd</sup> Draft version, though I have read it. In detail. 2 (Mr. Thong)
- 5) I have introduced a case of the remaining life assessment technology based on the current research depending on the request, though I have replied that criteria has not been established yet on WG meeting on 22/Jan. (Mr. Higo)
- 6) Is the micro structure inspection conducted when assessing the thermal power plant operating in Japan? (Mr. Thong)
- 7) It is conducted. We would advise, the clear criteria that can be determined the remaining life such as 3 years has not established, though micro structure inspection is conducted by the laboratory in Vietnam same as Japan. As explained in WG on 22?Jan, there is the practical measure that small piping may be replaced after rupture, though it is necessary monitoring before rupture of main piping may lead serious accident. (Mr. Koga)
- 8) Do you delete the all content of remaining life assessment by micro structure inspection from Pre-final version? (Mr. Thong)
- 9) I have introduced general assessment method conducting currently in Japan in the



Pre-final version. The inspection method of metal structure is described in Article160-a1.(Mr. Higo)

- 10) Do you want know how to evaluate the result of micro structure inspection?  
(Mr. Koga)
- 11) The content of remaining life assessment by micro structure inspection has been deleted from the Pre-final version, though the content of remaining life assessment was described in the 2<sup>nd</sup> Draft version. (Mr. Thong)
- 12) If EVN who is the owner of facility outsource the non-destructive examination, it should not be a problem even if there is no description of content for examination in the guideline. (Mr. Koga)
- 13) Pipe to be inspected is not described. (Mr. Thong)
- 14) Generally, steam drum, header and main piping which cannot be replaced easily are part to be inspected. (Mr. Koga)
- 15) I would comment after reading the Pre-final version. (Mr. Thong)
- 16) The reception comment has already closed. (Mr. Higo)
- 17) There were no objections from Vietnam side.

(19) Vol.5 Item-15: Steam turbine

- 1) It cannot be cope, since content is unknown. (Mr. Higo)
- 2) This is the comment that content for inspection of casing bolt of steam turbine should be supplemented. (Mr. Thong)
- 3) Tightening bolts of casing bolt in the state where the specified is not testing but the essential assembling work. (Mr. Koga)
- 4) It is the matters required after repair of turbine. (Mr. Thong)
- 5) We don't provide the content of manual level, since it is the work procedure after overhaul of turbine casing. (Mr. Koga)
- 6) It is necessary to supplement the inspection of casing bolt, since it is important. (Mr. Thong)
- 7) Steam only leak from flange joint because of the lass tightening force due to the heat expansion of bolt. I don't say that it is not important. It is the work of commonplace. (Mr. Koga)
- 8) It must be prescribed in the guideline, it is necessary to inspect in material or hardness because it is important for its safe. (Mr. Thong)
- 9) The importance level is not higher rather than higher such as rotating machine, since there is low possibility that it can lead to serious accident. Please remind the purpose of the technical regulation to prevent severe accident. For example, isn't there the specific value for tightening of casing bolt in case of the old plant or plant supplied by China? (Mr. Koga)
- 10) Off course, we have the specified value by the manufacturer. It is necessary to

prescribe inspection item for the casing bolt, though it is not necessary how to conduct. (Mr. Thong)

11) It is the work of commonplace. (Mr. Koga)

12) I don't supplement the item about casing bolt in the guideline. (Mr. Higo)

13) I agree. (Mr. Thong)

(20) Generalization of comment ver.6, 7

1) MOIT cannot comment, since agenda is so professional. Therefore, I ask to discuss with EVN and organize them. (Mr. Long)

2) We stated the opinions about comment table version 6, 7 and discussion about them have been completed. Therefore, we intend to deliver the Pre-final version to MOIT. They have been distributed as the CD-ROM version. Can we understand that it has been received? (Mr. Koga)

3) I would confirm to Mr. Cuong, since I have not received the CD-ROM myself. (Mr. Long)

4) Can we understand that Pre-final version has been received officially, since CD-ROM of Pre-final draft version has been distributed to MOIT, EVN, ETC1 and Mr. Nakamura? (Mr. Koga)

5) I agree. (Mr. Long)

3. Further plans and proposal for resolution on legislation of technical regulation

(1) Proposal for resolution on legislation of technical regulation

1) I think that it is necessary to resolve remaining issues on the legislation of the technical regulation. So, I propose to discuss about them this afternoon. (Mr. Koga)

2) What is the concrete content of discussion? I am not convenient in this afternoon and tomorrow. (Mr. Long)

3) I don't matter to Mr. Cuong instead you, if you are inconvenient. The content of discussion is the advice on the legislation of the technical regulation. In addition, this is the discussion of the only thermal group. (Mr. Koga)

4) Thanks to everyone for your proposal. I would like to thank cooperation on the development of the technical regulations and guidelines based on the request of Vietnam for 3 years. In addition, the issues on the legislation will be concluded in JCC/JMC meeting without discussing only in the thermal group, as the result that I talked with Mr. Cuong. (Mr. Long)

5) Please remind that the thermal group cannot correspond, if the conclusion of common for all groups is different with our policy. (Mr. Koga)

6) I will report all what are agreed in the thermal WG to Mr. Hoa and Mr. Cuong, since they are responsible after the completion of this project as you know. It is not necessary to discuss only in thermal WG about proposed issues, since there is the

relationship with other group. (Mr. Long)

- 7) The proposal issues are obtained and summarized throughout discussion with thermal WG, WS, VTA and the like. I regard that they are almost issues on legislation rather than field such as thermal or hydro. I would reconfirm that Mr. Long understand it is no need to discuss only in thermal WG today and tomorrow, since it will be transferred to Mr. Hoa and Mr. Cuong and discussed in JCC/JNC meeting. Is that right? (Mr. Koga)
- 8) It is right. (Mr. Long)
- 9) I understand what you say. I want the successful and immediate completion of legislation of the technical regulation. (Mr. Koga)
- 10) I think that it is necessary to investigate, review and collect comments along the load map in order to legislate without using current VN draft version as it is. (Mr. Long)
- 11) I expect immediate legislation, since the purpose of this mission has been achieved. (Mr. Koga)
- 12) I ask EVN to further comment after reviewing technical content. (Mr. Long)
- 13) The reception comment has already closed. (Mr. Koga)
- 14) I agree. Today's meeting is terminated by this. (Mr. Long)

(2) Further plans

- 1) We submit the EN and VN Pre-final Draft all together based on the result of this mission on middle of Mar. In addition, there is little revision of draft guideline of thermal group due to discussion in this mission. The Pre-final guideline is expected to get approval on the 11<sup>th</sup> Mission scheduled on 10~15/April. After that, MOIT will begin the process of legislation. (Mr. Nakamura)
- 2) The schedule of JCC/JMC meeting must be adjusted with Mr. Hoa and Mr. Cuong who are responsible for entire project as coordinator. (Mr. Long)
- 3) I agree. I think that the project will finish substantially in April and the last mission on June is just for project closing ceremony. (Mr. Nakamura)
- 4) The thermal WG will completed on 31/Mar as scheduled without extension of project schedule. The project closing ceremony on June was not in the plan. (Mr. Long)
- 5) The project closing ceremony is expected to be held in June, since the extension of project period is agreed between Vietnam and Japan. In addition, the final evaluation by JICA is scheduled on April. I would like to hope cooperation. (Mr. Nakamura)
- 6) I agree.(Mr. Long)

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### 8. Minutes of 23<sup>rd</sup> WG Meeting (Thermal Power Group)

|  |      |  |
|--|------|--|
| Date and Time:   |      | 18/April/2013 15:35 – 16:20  |
| Vietnamese Counterpart:  |      | MOIT (Ministry of Industry and Trade)<br>ETC (Electric Testing Center) |
| Venue:   |      | 204 Meeting room (2F) at MOIT  |
| Participants:  | MOIT | Mr. Long   |
|  | ETC1 | Mr. Yen, Mr. Anh   |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Imamura (Electrical)            |
|  |      | Interpreter: Ms. Nhung   |
| Contents   |      |  |
| <p>1. Today's agenda</p> <p>(1) Contents of reporting of meeting on the 7<sup>th</sup> Joint Management Committee (JMC)</p> <p>2. Contents of reporting of meeting on the 7<sup>th</sup>JMC</p> <p>(1) Contents of reporting of meeting on the 7<sup>th</sup>JMC</p> <p>1) We do not prepare any new agenda to discuss because today's agendum is only confirmation of contents of reporting of meeting on the 7<sup>th</sup>JMC. Materials of the meeting on the 7<sup>th</sup>JMC which the JICA project team leader, Mr. Nakamura, is preparing contain same purport with today's handout and we are going to outline the reporting. (Mr. Koga)</p> <p>2) I ask you to explain only thermal power sector part of the contents of reporting of meeting on the 7<sup>th</sup>JMC. (Mr. Long)</p> <p>3) The present conditions of the thermal power sector are honestly reported in the handout as it is. We consider that there is not an issue in the part of reporting on the item 1&amp;2 in the handout. Because a schedule of promulgation of the technical regulations (TR) after the handover of their drafts is unclear, we hope that you will finish the promulgation yourselves after inviting public comments as the item 2 (3) 2) in the handout. (Mr. Koga)</p> <p>4) Regarding how you conclude the mandatory TR about the item 2 (3) in the handout, since a position between general group of MOIT and thermal power group of that is different, we hope that you will discuss it in depth each other. (Mr. Koga)</p> <p>5) Regarding a legal position of the technical guidelines (GL) about the item 3 in the handout, we affirm that the GL should not be an appendix of the TR, and recommend that it is reasonable to publish as a reference book without a legal status by agency or subordinate institution of MOIT. In addition, it will be</p> |      |  |

necessary to take Vietnamese technical standard (TCVN) into the GL after addition of TCVN in the future because only the GL which is provided will result in a lack of technical background information. (Mr. Koga)

- 6) We are only going to report only the above said at the meeting on the 7<sup>th</sup>JMC. Also, it is expected that the team leader, Mr. Nakamura, will ask you the schedule of promulgation of the TR. Since we have performed our task on the project for three years as much as possible, we are going to report our work having finished at the meeting on the 7<sup>th</sup>JMC though a point for reconsideration that we did not confirm that the TR developed by us were best as the Vietnamese ministerial ordinance is left. (Mr. Koga)
- 7) Contents you explained are almost same as the contents of consultation with the team leader, Mr. Nakamura and a female staff of JICA office on 16 April about the reporting contents of the meeting on the 7<sup>th</sup>JMC. I consider that content of the TR and GL developed by the JICA team meet Vietnamese expectations. In addition, there is a slight point which EVN has raised about technical matter which is not applicable to all Vietnamese power plants, however, I consider that Vietnamese side will be able to deal with the point in the future. (Mr. Long)

(2) Main points of discussion on January 2013 for pre-final draft GL and reflection of results (Item 1 in the handout)

- 1) Technical contents of the pre-final draft GL is the latest at present and meet Vietnamese expectations. I understand that updating the GL will be necessary as technologies advance in the future. I discussed the TR and GL with the team leader, Mr. Nakamura on 16 April and the TR and GL for the design of thermal power are most valuable contents for us among the TR and GL which have been developed by JICA. Since these contain new and wide information for Vietnamese side, I appreciate that JICA has given us assistance in the project. (Mr. Long)

(3) Status report of draft TR and future schedule (Item 2 in the handout)

- 1) As you know well, there are the TR (mandatory) and GL (voluntary). MOIT has a duty to arrange promulgation schedule of the TR (mandatory) for hydro power, thermal power and network at the same time, however, we can discuss their contents only at the thermal WG meeting because that is scope of general group of Science and Technology Department of MOIT. In addition, I discussed the promulgation with the team leader, Mr. Nakamura the other day and consider that it is desirable for the Science and Technology Department of MOIT to be in charge of the promulgation of the TR because that has coordinated the project as a contact point for three years. (Mr. Long)

- 2) Does MOIT have already determined that which department or group is in charge of the promulgation of the TR? (Mr. Koga)
- 3) MOIT includes General Department of Energy at present, however, the Science and Technology Department has been in charge of promulgations. Regarding this project, I consider that it is desirable for the Science and Technology Department which has coordinated the project as contact point for three years to be in charge of the promulgation of the TR. (Mr. Long)

(4) Positioning of GL in the process of legislation of TR (Item 3 in the handout)

- 1) Regarding suggestion that it is necessary to take TCVN into the GL after addition of TCVN in the future, I consider that it is not scope of thermal power WG but that of department of developing TCVN, if technical supplementation is needed with TCVN. (Mr. Long)
- 2) Item 3 (3) in the handout means that it is not necessary to contain same information as TCVN in the GL after becoming practicable use and addition of TCVN since the GL shows an example to achieve the TR. (Mr. Koga)
- 3) I understand that. (Mr. Long)
- 4) Each power plant must develop its practical administration manual as reference to manufacturer's O&M manuals after promulgation of the TR like item 3 (3) in the handout. (Mr. Long)
- 5) Necessary document for each power plant, which is provided in volume 4&5 of the TR, means an administration manual. Item 3 (3) in the handout means that we ask you to make public knowledge that a newly power plant is required to develop an administration manual as same as an existing power plant. As we have already explained that at WS, it is necessary to understand that the administration manual is most important document for a power plant and there is possibility that no administration manual result in shutdown of a power plant when an on-the-spot inspection by MOIT. (Mr. Koga)
- 6) I understand that. (Mr. Long)

(5) Conclusion

- 1) Although major meetings are scheduled to be held two times, this WG meeting is the last of the thermal power group. I consider that contents of the final draft TR and GL developed by JICA team basically meet Vietnamese expectations with cooperation of the authorities concerned and power plants, and am going to explain the same above said when a transfer of them. Regarding this matter, I made a same comment to JICA the other day. The contents of thermal power have got a high evaluation. (Mr. Long)

- 2) It is very kind of your said. We hope that the TR is promulgated by the general group of MOIT as soon as possible, however, it takes much time for the promulgation. We have reflected selected comments which are from not only WG but also WS and interviews of the parties concerned into the TR and GL. As this project for three years will be finished soon and we appreciate your cooperation for a long time. (Mr. Koga)
- 3) I have been busy as a leader of WG of the thermal power group performing other works and express my thanks to JICA experts for a finish with smooth progress. Although there were objections to the draft the TR and GL while developing, there is no problem at the last stage because there is only a transfer. (Mr. Long)
- 4) There is a point for reconsideration that if the comments had submitted in the early stage, we would reflect them into the TR and GL, but this is a story if we have much time. (Mr. Koga)
- 5) I understand that. (Mr. Long)
- 6) We hope you make a good statement at the meeting on the 7<sup>th</sup>JMC. (Mr. Koga)

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## **Appendix-4.3**

### **Minutes of Working Group Meeting (Network Group)**

1. Draft Minutes of 24<sup>th</sup> Working Group Meeting (Network Group) (July 9, 2012)
2. Draft Minutes of 25<sup>th</sup> Working Group Meeting (Network Group) (July, 11, 2012)
3. Draft Minutes of 26<sup>th</sup> Working Group Meeting (Network Group) (July, 13, 2012)
4. Draft Minutes of 27<sup>th</sup> Working Group Meeting (Network Group) (July.16, 2012)
5. Draft Minutes of 28<sup>th</sup> Working Group Meeting (Network Group) (Aug. .1, 2012)
6. Draft Minutes of 29<sup>th</sup> Working Group Meeting (Network Group) (Aug, 3, 2012)
7. Draft Minutes of 30<sup>th</sup> Working Group Meeting (Network Group) (Aug, 31, 2012)
8. Draft Minutes of 31<sup>st</sup> Working Group Meeting (Network Group) (Oct. 23, 2012)
9. Draft Minutes of 32<sup>nd</sup> Working Group Meeting (Network Group) (Jan.17, 2012)
10. Draft Minutes of 33<sup>rd</sup> Working Group Meeting (Network Group) (April.18, 2013)



## 1. Draft Minutes of 24th Working Group Meeting (Network Group) (July 9, 2012)

|   |  |
|---|--|
| Date:   | 9 <sup>th</sup> July 2012 from 8:30 to 17:00   |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Mr. Viet, Ms. Binh, Mr. Trung, Mr. Khiem<br>Expert Mr.Thong<br>ETC Mr.Linh, Mr.Huy |
| Venue   | MOIT Conference room 207   |
| JICA member   | JICA Network Team Mr. Masuda, Mr. Aki  |
| Schedule of WG Network  |  |
| 9 <sup>th</sup> , July. : Review of Technical Regulation (Article I.1.2, 6, 7, 8 & I.3.47, 48, 50 in Vol.1)   |  |
| <p><b>【Review of Technical Regulation】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side reviewed the revision of the final draft of Technical Regulation which is revised according to the result of the WG meeting on May 2012.</li> <li>- The articles were reviewed by JICA team and Vietnamese side according to above-mentioned schedule of WG Network.</li> <li>- The conclusion of the review is shown in Discussion table regarding the revision of the final draft of Technical Regulation Vol.1 (Refer to Attachment).</li> <li>- Until now, Vietnamese side did not submit any comments on the articles except the above-mentioned articles in the revision of the final draft of Technical Regulation</li> <li>- Vietnam side will reconfirm about numerical regulations for technical quantitative values for safety in Vol.1 after JICA send the revised final draft by end of July. Vietnam side will submit comments which clarify modified contents in detail as well as the number of articles and table, if it is necessary to modify the numerical regulations for technical quantitative values for safety in the revision of the final draft of Technical Regulation Vol.1.</li> </ul> <p>(Vietnam side agree s with numerical regulations for safety which JICA put in technical regulation. Regarding numerical regulations for the other technical quantitative values, Vietnam side opines that such regulations are recommended to be put in GL)</p> <p><b>【Confirmation of minutes and revision】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side agreed with the conclusion of WG meeting.</li> </ul> <p><b>【Submission of Guideline】</b></p> <ul style="list-style-type: none"> <li>- The deadline of Guideline Vol.3, 4, 5 is extended by 26<sup>th</sup> August because Guidelines have to be revised according to comments from Vietnamese side.</li> <li>- In addition to the above, JICA teams will complete the Guideline Vol.3, 4, 5 including the parts which have not been sent to Vietnam's side.</li> </ul> <p><b>【Attachment】</b></p> <ul style="list-style-type: none"> <li>- Discussion table on the revision of the final draft of Technical Regulation Vol.1</li> </ul> |  |
| Concluded   |  |

## 2. Draft Minutes of 25th Working Group Meeting (Network Group) (July, 11, 2012)

|   |  |
|---|--|
| Date:   | 11 <sup>th</sup> July 2012 from 8:30 to 17:00  |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Mr. Viet, Ms. Binh, Mr. Trung, Mr. Khiem<br>Expert Mr.Thong<br>ETC Mr.Linh, Mr.Huy |
| Venue   | MOIT Conference room 207   |
| JICA member   | JICA Network Team Mr. Masuda, Mr. Aki  |
| Schedule of WG Network  |  |
| 11 <sup>th</sup> , July. : Review of Technical Regulation (Article I.3.50, 74, 88, 107, 108, 110 in Vol.1)  |  |
| <p><b>【Review of Technical Regulation】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side reviewed the revision of the final draft of Technical Regulation which is revised according to the result of the WG meeting on May 2012.</li> <li>- The articles were reviewed by JICA team and Vietnamese side according to above-mentioned schedule of WG Network.</li> <li>- The conclusion of the review is shown in Discussion table regarding the revision of the final draft of Technical Regulation Vol.1 (Refer to Attachment).</li> <li>- Until now, Vietnamese side did not submit any comments on the articles except the above-mentioned articles in the revision of the final draft of Technical Regulation</li> <li>- Vietnam side will reconfirm about numerical regulations for technical quantitative values for safety in Vol.1 after JICA send the revised final draft by end of July. Vietnam side will submit comments which clarify modified contents in detail as well as the number of articles and table, if it is necessary to modify the numerical regulations for technical quantitative values for safety in the revision of the final draft of Technical Regulation Vol.1.</li> </ul> <p>(Vietnam side agree s with numerical regulations for safety which JICA put in technical regulation. Regarding numerical regulations for the other technical quantitative values, Vietnam side opines that such regulations are recommended to be put in GL)</p> <p><b>【Confirmation of minutes and revision】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side agreed with the conclusion of WG meeting.</li> </ul> <p><b>【Submission of Guideline】</b></p> <ul style="list-style-type: none"> <li>- The deadline of Guideline Vol.3, 4, 5 is extended by 26<sup>th</sup> August because Guidelines have to be revised according to comments from Vietnamese side.</li> <li>- In addition to the above, JICA teams will complete the Guideline Vol.3, 4, 5 including the parts which have not been sent to Vietnam's side.</li> </ul> <p><b>【Attachment】</b></p> <ul style="list-style-type: none"> <li>- Discussion table on the revision of the final draft of Technical Regulation Vol.1</li> </ul> |  |
| Concluded   |  |

### 3. Draft Minutes of 26th Working Group Meeting (Network Group) (July, 13, 2012)

|   |  |
|---|--|
| Date:   | 13 <sup>th</sup> July 2012 from 8:30 to 17:00  |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Mr. Viet, Ms. Binh, Mr. Trung, Mr. Khiem<br>Expert Mr.Thong<br>ETC Mr.Linh, Mr.Huy |
| Venue   | MOIT Conference room 207   |
| JICA member   | JICA Network Team Mr. Masuda, Mr. Aki  |
| Schedule of WG Network  |  |
| 13 <sup>th</sup> , July. : Review of Technical Regulation (Article I.3.118, 124, 126, 134,136,143 in Vol.1)   |  |
| <p><b>【Review of Technical Regulation】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side reviewed the revision of the final draft of Technical Regulation which is revised according to the result of the WG meeting on May 2012.</li> <li>- The articles were reviewed by JICA team and Vietnamese side according to above-mentioned schedule of WG Network.</li> <li>- The conclusion of the review is shown in Discussion table regarding the revision of the final draft of Technical Regulation Vol.1 (Refer to Attachment).</li> <li>- Until now, Vietnamese side did not submit any comments on the articles except the above-mentioned articles in the revision of the final draft of Technical Regulation</li> <li>- Vietnam side will reconfirm about numerical regulations for technical quantitative values for safety in Vol.1 after JICA send the revised final draft by end of July. Vietnam side will submit comments which clarify modified contents in detail as well as the number of articles and table, if it is necessary to modify the numerical regulations for technical quantitative values for safety in the revision of the final draft of Technical Regulation Vol.1.</li> </ul> <p>(Vietnam side agree s with numerical regulations for safety which JICA put in technical regulation. Regarding numerical regulations for the other technical quantitative values, Vietnam side opines that such regulations are recommended to be put in GL)</p> <p><b>【Confirmation of minutes and revision】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side agreed with the conclusion of WG meeting.</li> </ul> <p><b>【Submission of Guideline】</b></p> <ul style="list-style-type: none"> <li>- The deadline of Guideline Vol.3, 4, 5 is extended by 26<sup>th</sup> August because Guidelines have to be revised according to comments from Vietnamese side.</li> <li>- In addition to the above, JICA teams will complete the Guideline Vol.3, 4, 5 including the parts which have not been sent to Vietnam's side.</li> </ul> <p><b>【Attachment】</b></p> <ul style="list-style-type: none"> <li>- Discussion table on the revision of the final draft of Technical Regulation Vol.1</li> </ul> |  |
| Concluded   |  |

#### 4. Draft Minutes of 27th Working Group Meeting (Network Group) (July.16, 2012)

|   |  |
|---|--|
| Date:   | 16 <sup>th</sup> July 2012 from 8:30 to 17:00  |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Mr. Viet, Ms. Binh, Mr. Trung, Mr. Khiem<br>Expert Mr.Thong<br>ETC Mr.Linh, Mr.Huy |
| Venue   | MOIT Conference room 207   |
| JICA member   | JICA Network Team Mr. Masuda, Mr. Aki  |
| Schedule of WG Network  |  |
| 16 <sup>th</sup> , July. : Confirmation of minutes and discussion table   |  |
| <p><b>【Review of Technical Regulation】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side reviewed the revision of the final draft of Technical Regulation which is revised according to the result of the WG meeting on May 2012.</li> <li>- The articles were reviewed by JICA team and Vietnamese side according to above-mentioned schedule of WG Network.</li> <li>- The conclusion of the review is shown in Discussion table regarding the revision of the final draft of Technical Regulation Vol.1 (Refer to Attachment).</li> <li>- Until now, Vietnamese side did not submit any comments on the articles except the above-mentioned articles in the revision of the final draft of Technical Regulation</li> <li>- Vietnam side will reconfirm about numerical regulations for technical quantitative values for safety in Vol.1 after JICA send the revised final draft by end of July. Vietnam side will submit comments which clarify modified contents in detail as well as the number of articles and table, if it is necessary to modify the numerical regulations for technical quantitative values for safety in the revision of the final draft of Technical Regulation Vol.1.</li> </ul> <p>(Vietnam side agree s with numerical regulations for safety which JICA put in technical regulation. Regarding numerical regulations for the other technical quantitative values, Vietnam side opines that such regulations are recommended to be put in GL)</p> <p><b>【Confirmation of minutes and revision】</b></p> <ul style="list-style-type: none"> <li>- JICA team and Vietnamese side agreed with the conclusion of WG meeting.</li> </ul> <p><b>【Submission of Guideline】</b></p> <ul style="list-style-type: none"> <li>- The deadline of Guideline Vol.3, 4, 5 is extended by 26<sup>th</sup> August because Guidelines have to be revised according to comments from Vietnamese side.</li> <li>- In addition to the above, JICA teams will complete the Guideline Vol.3, 4, 5 including the parts which have not been sent to Vietnam's side.</li> </ul> <p><b>【Attachment】</b></p> <ul style="list-style-type: none"> <li>- Discussion table on the revision of the final draft of Technical Regulation Vol.1</li> </ul> |  |
| Concluded   |  |

### 5. Draft Minutes of 28th Working Group Meeting (Network Group) (Aug. .1, 2012)

|  |  |
|--|--|
| Date:  | 1 <sup>st</sup> , August 2012  |
| Participants   | MOIT Mr. Cuong<br>EVN Mr. Viet, Ms. Binh, Mr. Khiem, Mr. Trung<br>ETC Mr.Duc, Mr. Linh |
| Venue  | MOIT Conference room 207   |
| JICA member  | JICA Network Team Mr. Ken Kuwahara, Mr. Aki  |
| <p>Schedule of WG Network</p> <p><b>【28<sup>th</sup>WG】</b> 1st, August from 8:30-16:30</p> <p>1) Explaining project procedure for developing the Guideline</p> <p>2) Achieving the results of discussion of Guideline on Vol.4 (Article 267, 271, 274, 277, 298, 300)</p> <p>3) Achieving the results of discussion of Guideline on Vol.3<br/>(Article 90, 98, 103, 120, 121, 124, 126, 127, 138, 160, 180, 212)</p> <p><b>【Attachment】</b></p> <p>-- Comment table in Vol.3</p> <p>-- Comment table in Vol.4</p> <p style="text-align: right;">Concluded</p> |  |

## 6. Draft Minutes of 29th Working Group Meeting (Network Group) (Aug, 3, 2012)

|   |  |
|---|--|
| Date:   | 3 <sup>rd</sup> , August 2012  |
| Participants  | MOIT Mr. Cuong<br>EVN Mr. Viet, Ms. Binh, Mr. Khiem, Mr. Trung<br>ETC Mr.Duc, Mr. Linh |
| Venue   | MOIT Conference room 207   |
| JICA member   | JICA Network Team Mr. Ken Kuwahara, Mr. Aki  |
| <p>Schedule of WG Network</p> <p>1) Achieving the results of discussion on Vol.3 (Article 213, 214, 219, 236, 248)</p> <p>2) Confirming the project procedures and the measurements for developing the Guideline</p> <p><b>1. Explaining and confirming the project procedures for developing the Guideline</b></p> <p>JICA team explained the current progress of the development for Guideline. And JICA accepted the requests from MOIT as follows,</p> <p>1) MOIT requested JICA to revise the Guideline on Vol.5 according to the comments by ETC.<br/>JICA will dispatch the consultants in charge of Vol.5 at the end of August.</p> <p>2) Both MOIT and JICA confirmed the deadline to submit the Draft Guideline and its comments table below.</p> <p>-- Vol.1 1<sup>st</sup> draft Guideline until 15<sup>th</sup>, September</p> <p>-- Vol.3 2<sup>nd</sup> Draft Guideline and its comment table until 26, August</p> <p>-- Vol.4 2<sup>nd</sup> Draft Guideline and its comment table until 26, August</p> <p>-- Vol.5 2<sup>nd</sup> Draft Guideline and its comment table until 26, August</p> <p>3) Both MOIT and JICA confirmed the project procedures as follows,</p> <p><u>-- Metering Guideline in Vol.1</u></p> <p>VN_WG understood the big differences between the metering system in Vietnam and that in Japan, and Vietnamese engineers both EVN(Mr.Binh) and ETC(Mr.Tuan) will check the existing regulation regarding meters and measurements devices. JICA will study the proper contents of guideline after receiving the reply from them.</p> <p><u>-- Low voltage wiring guideline in Vol.3</u></p> <p>MOIT and EVN understood that these contents contain the in-house wiring and there are other standard (QCVN:QTĐ 08:2010/BCT) regarding in-house wiring in MOIT. JICA will make their Guideline temporary utilizing the existing VN standard and discuss them in coming WG.</p> <p><u>-- the general rule for naming the title in Guideline</u></p> <p>Vietnamese side commented that there are some mismatches between the title and the contents in Guideline. However, both Vietnamese side and JICA agreed that both numbering and titles should not be modified, because same title name is easy to understand.</p> |  |

4) Next schedule for WG

Both MOIT and JICA decide the next schedule of WG is 30<sup>th</sup> August in Hanoi and no meeting until 4<sup>th</sup> September because of Vietnamese independence holiday.

**2. Achieving the result of discussion on Vol.3 and 4**

JICA team and Vietnamese side reviewed all the comments and achieved the conclusions shown in comment table (Refer to Attachment).

Because the meanings of some comments are still unclear to JICA through the discussion between JICA and the local consultant (ETC), the articles related to such comments should not be modified.

**【Attachment】**

-- Comment table in Vol.3

-- Comment table in Vol.4

Concluded

## 7. Draft Minutes of 30th Working Group Meeting (Network Group) (Aug, 31, 2012)

|   |   |
|---|---|
| Date:   | 31 <sup>th</sup> , August 2012  |
| Participants  | MOIT Mr. Cuong<br>EVN Mr. Viet, Mr. Khiem<br>Consultant and construction joint stock company Mr. Chan<br>ETC Mr.Linh, Mr. Thanh |
| Venue   | MOIT Conference room 207  |
| JICA member   | JICA Network Team Mr. Fujino, Mr. Yamada  |
| <p>Schedule of WG Network</p> <p>- Explaining the Guideline of withstand voltage test (Article 27, 28, 29, 30, 31, 32, 33, 34, 36, 37)</p> <p><b>Explaining the Guideline of withstand voltage test</b></p> <p>- JICA team explained the current guideline about withstand voltage test. JICA team and Vietnamese side reviewed the guideline. The conclusions and modifications are as a discussion table (Refer to Attachment).</p> <p>- JICA will revise the guideline according to the result of this meeting. But these revisions are not reflected on the 2nd draft because the 2nd draft guideline was already printed. The revised contents will be reflected on the 3rd draft.</p> <p>- Hereafter, JICA will revise the guideline about withstand voltage test in consultation with ETC if it is necessary.</p> <p>- There is no modification of the technical regulation due to the result of this meeting.</p> <p style="text-align: right;">Concluded</p> |   |



### 8. Draft Minutes of 31st Working Group Meeting (Network Group) (Oct. 23, 2012)

|   |  |
|---|--|
| Date:   | 23 <sup>rd</sup> October 2012 from 10:00 to 17:00                                    |
| Participants  | MOIT Mr. Cuong<br>EVN Mr. Viet, Ms. Binh<br>VN consultant Mr.Cao Chan<br>ETC Mr.Linh |
| Venue   | MOIT Conference room 206, 210  |
| JICA member   | JICA Network Team Mr. Kuwahara, Mr. Aki, Mr. Yamada,<br>Mr. Masuda,                  |
| <p>Agenda</p> <ul style="list-style-type: none"> <li>- Confirmation of the comment on "Area classification (article I.1.1 22), I.1.8 4) and all article in Chapter 3-3-8 and 3-3-9, etc.)" on the final drafts of Technical Regulation Vol.1</li> <li>- Confirmation of the presentation of WS.</li> <li>- Confirmation of the comment from VN consultant</li> </ul> <p><b>【Confirm of the comment on "Area classification"】</b></p> <ul style="list-style-type: none"> <li>- There are the suggestions on "Area classification (article I.1.1 22), I.1.8 4) and all article in Chapter 3-3-8 and 3-3-9, etc.)" from VN consultant.</li> </ul> <p>As it was already approved by VN side in July 2012, JICA rejected these revisions because that makes all the related part needed to change again.</p> <ul style="list-style-type: none"> <li>- Both sides agreed to these suggestions and VN side will have the responsibilities for the revision in the draft of Technical Regulation and Guideline and all related to comments on it.</li> <li>- As for above-mentioned comments and all related to comments on it, Vietnamese side will have the approval for the revision by related Ministries in Vietnam.</li> </ul> <p><b>【Confirmation of the presentation of WS】</b></p> <ul style="list-style-type: none"> <li>- Comments from Vietnamese participants of WS will be organized and checked by Vietnamese side.</li> <li>- JICA and Vietnamese side agreed that the deadline of organized and checked comments is 1<sup>st</sup> week of December.</li> <li>- Vietnamese side agreed to the WS material made by JICA.</li> </ul> <p><b>【Confirmation of the comments from VN consultant】</b></p> <ul style="list-style-type: none"> <li>- JICA and Vietnamese side agreed to the conclusions of comment tables on the final drafts of Technical Regulation Vol.1, 3, 4 on 23<sup>rd</sup> October 2012.</li> </ul> |  |
| Concluded   |  |

### 9. Draft Minutes of 32nd Working Group Meeting (Network Group) (Jan.17, 2012)

|   |   |
|---|---|
| Date:   | 17 <sup>th</sup> January 2013 from 8:30 to 10:30  |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Ms. Binh, Mr.Kiem, Mr.Chung<br>ETC Mr. Duc, Mr.Linh<br>VINAconsultant Mr.Cao Chan |
| Venue   | MOIT Conference room 204  |
| JICA member   | JICA Network Team Mr. Aki, Mr. Yamada, Mr. Masuda,<br>Mr. Fujino<br>Interpreter Ms. Nga                           |
| <p>Agenda</p> <ul style="list-style-type: none"> <li>- Explanation and Confirmation of JICA's replies to the comments on Guideline proposed in the 3<sup>rd</sup> Workshop</li> </ul>   |   |
| <p><u>[Explanation and Confirmation of reply to comment]</u></p> <ul style="list-style-type: none"> <li>- Both Vietnamese side and JICA had discussion on the replies to the comments on Guideline. And both parties agreed to the conclusion on the comments.</li> <li>- The Conclusion is shown in the comment table (Attachment).</li> </ul> |   |
| <p>Attachment</p> <ul style="list-style-type: none"> <li>- Comment table on Guideline proposed in the 3<sup>rd</sup> Workshop</li> </ul>  |   |
| Concluded   |   |

### 10. Draft Minutes of 33rd Working Group Meeting (Network Group) (April.18, 2013)

|   |   |
|---|---|
| Date:   | 18 <sup>th</sup> April 2013 from 13:30 to 14:30   |
| Participants  | MOIT Mr. Cuong, Mr. Dung<br>EVN Ms. Binh, Mr.Kiem<br>ETC Mr. Duc, Mr.Linh<br>VINAconsultant Mr.Cao Chan |
| Venue   | MOIT Conference room 204  |
| JICA member   | JICA Team Mr. KEN, Mr. Aki, Mr. Yamada, Mr. Masuda,<br>Interpreter Ms. Nga                              |
| Agenda  |   |
| - Explanation and Confirmation of the presentation documents of 7 <sup>th</sup> JMC on 24 <sup>th</sup> April   |   |
| <u>[Discussion about the presentation documents]</u>  |   |
| - Both Vietnamese and JICA had discussion on the presentation materials of 7 <sup>th</sup> JMC. And both parties agreed the contents of the presentation material.  |   |
| <u>[Request from MOIT Safety departments ]</u>  |   |
| - MOIT will issue the decree about safety rule in July. Now they are collecting the objection comments from public. Mr.Dung from Safety department asked JICA to reflect the two contents of this new decree. |   |
| 1) Minimum requirement of the electric field strength for line man  |   |
| 2) Inhabited area under the high voltage transmissions line   |   |
| - JICA checked the contents carefully and decided that they have not fixed yet and it may have some troubles to reflect the content that is not decided yet.  |   |
| - Vietnamese side agreed JICA's reply and they will reflect those contents by themselves after they finish issuing this decree.   |   |
| Concluded   |   |

## **Appendix-5**

### **Minutes of Workshop**

- 1. Hydropower Group**
- 2. Thermal Power Group**
- 3. Network Group**

## **Appendix-5.1**

### **Minutes of Workshop (Hydropower Group)**

|    |   |             |
|----|---|-------------|
| 1. | Minutes of 1 <sup>st</sup> Workshop in HCMC     | 11/Mar/2011 |
| 2. | Minutes of 1 <sup>st</sup> Workshop in HANOI    | 15/Mar/2011 |
| 3. | Minutes of 2 <sup>nd</sup> Workshop in HCMC     | 22/Jun/2011 |
| 4. | Minutes of 2 <sup>nd</sup> Workshop in Nha Tran | 24/Jun/2011 |
| 5. | Minutes of 2 <sup>nd</sup> Workshop in HANOI    | 28/Jun/2011 |
| 6. | Minutes of 3 <sup>rd</sup> Workshop in HCMC     | 26/Oct/2012 |
| 7. | Minutes of 3 <sup>rd</sup> Workshop in HANOI    | 30/Oct/2012 |

## 1. Minutes of 1<sup>st</sup> Workshop in HCMC

**REPORT OF 1<sup>ST</sup> WORKSHOP**  
**ELECTRIC POWER TECHNICAL STANDARDS PROMOTION**  
**PROJECT IN VIET NAM**  
**HYDROPOWER GROUP**

Hồ Chí Minh City, 11 March 2011

### 1. General

In order to deploy the project of promoting and enhancing Vietnam electric power technical standards, which is the co-operation between the Ministry of Industry and Trade (MOIT), the Ministry of Construction (MOC) and Japan International Cooperation Agency (JICA), dated March 11<sup>th</sup> 2011, under the presiding of the Ministry of Industry and Trade and the Ministry of Construction, JICA held the first workshop in HCMC. The purpose of this workshop is to introduce and collect suggestions from Electrical operation organizations in Central and Southern areas for volumes 5 and 6 of QCVN – QTD as well as for the new volume for the design, construction and completion inspection of hydropower civil works under MOC.

### 2. Participants

- MOIT: Mr. Phương Hoàng Kim

- MOC: Mr. Vũ Hữu Hà

And representative of hydropower plant and Electrical Unit as follows:

| Name              | Company/plant    |
|-------------------|------------------|
| Mai Anh Vũ        | Yaly HPC         |
| Nguyễn Tuấn Thoại |                  |
| Thái Đình Quốc    | Quảng Trị HPC    |
| Đặng Trung Thi    | Sê San 4 HPC     |
| Nguyễn Phụng Long | Sông Ba Hạ HPC   |
| Trần Kì Hải       | Buôn Kuốp HPC    |
| Mai Hải An        |                  |
| Nguyễn Văn Lân    | Sông Tranh 2 HPC |
| Trần Văn Hải      |                  |

| Name                 | Company/plant                          |
|----------------------|--|
| Võ Tăng Lý           | Đại Ninh HPC                           |
| Nguyễn Hữu Phước     |  |
| Nguyễn Thành Vinh    | Đồng Nai 3 HPC                         |
| Văn Min              | PECC3                                  |
| Phạm Văn Minh        |  |
| Tạ Quốc Dũng         | PECC 4                                 |
| Lương Ngọc Thạch     | ETC2                                   |
| Lê Trọng Trí         |  |
| Bạch Ngọc Mạnh Tường |  |
| Nguyễn Văn Minh      | Southern hydropower jointstock company |
| Hồ Ngọc Tương        |  |
| Lê Trọng Tiến        | PECC 2                                 |
| Mai Tuấn Anh         |  |
| Lê Đình Ban          | A Vương HPC                            |
| Võ Tấn Nhẫn          | Trị An HPC                             |
| Trần Quang           |  |
| Đoàn Mạnh Dũng       | Đa Nhim-Hàm Thuận-Đa Mi HPC            |
| Võ Tiến Sĩ           | Thác Mơ HPC                            |
| Đặng Ngọc Tú         |  |
| Võ Hữu Đước          | Srok Phu Miêng HPC                     |

### 3. Content

Contents of meeting

#### 3.1. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.5 in construction, civil work and hydromechanical

-Modify in Article 2: Scope of application

-Modily in Article 74: classification of hydropower plant from the classification in TCVDVN-285 to those stipulated in QCVN 03: 2009/BXD

-Modify in Article 100: Frequency of periodic inspection

The frequency of periodic inspection for waterways was newly proposed to be “every 6 year or more frequently” instead of every 3 years more frequently for other structures and equipment. (JICA’s opinion)

### **3.2. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.5 in Electrical part**

- Changing in arrangement of chapter 3 – Hydropower plant:

Chapter 3 shall be separated in 4 sections by adding Section 4 “Power Plant Equipment (PPE)” to the original edition as follows:

Section 1: Generator/Generator-motor

Section 2: Turbine/Pump-turbineMotor

Section 3: Auxiliary equipments of Turbine/Generator

Section 4: Power plant equipment

- Presenting about detail changing in Vol.5 chapter 3, testing items was separated into 2 types:

- Dry test: testing in in-progress
- Wet test: testing after finishing the installation

- Presenting about changing and addition in these Article 74,79, 80, 81, 82, ...

### **3.3. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.6 in construction, civil work and hydromechanical**

- Modify in Article 2: Scope of application

And changing in other Articles. Article 63, 64, 65 were moved to guideline

Changing and addition in Article 70.

### **3.4. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.6 in Electrical part**

There were 2 changing in Article 91 and Article 98.

Explanation about the difference between 2 terminologies “runner pit” and “turbine pit” .

Addition Article 99.

### **3.5. Representative about draft of QCVN in construction of hydro civil work which was presented by MOC**

- Presenting about background and direction of project
- Presenting about arrangement and main contents in document.



#### 4. Questions for Discussion

During the workshop, these organizations contributed the following opinions for volumes 5 and 6 of QCVN.

1. Mr. Long- Ba Ha River Hydropower Company\_

Email: [phunglongsbh@yahoo.com](mailto:phunglongsbh@yahoo.com)

Contact number: 01.655.769.689

Please supplement the after-installation testing in order to identify the following parameters of a generator:  $X_d$ ,  $X'_d$ ,  $X''_d$ ,  $X'_q$ ,  $X''_q$

**Answer-1a:** *The reactances,  $X_d$ ,  $X'_d$ ,  $X''_d$ ,  $X'_q$ ,  $X''_q$ , will be identified as following;*

- $X_d$  : *It will be derived from “No-load open-circuit test and three-phase short circuit test.*
- $X'_d$  : *It will be derived from “Sudden three-phase short-circuit test. Or, it will be derived from ”Applied voltage test” which is a “Type test”of “Sudden three-phase open-circuit test.*
- $X''_d$  : *It will be derived from “Sudden three-phase short-circuit test.*
- *Or, it will be derived from ”Dalton-Cameron method”, or, ”Applied voltage test”.*
- $X'_q$  : *It will be derived from “Low slip test”. However, It is not provided in IEC.*
- $X''_q$  : *It will be derived from ”Applied voltage test”,or ”Dalton-Cameron method”.*

*However, normally after-installation test is not carried out because of demanding test for generator at site, such as, “Sudden three-phase short-circuit test”, and /or “Sudden three-phase open-circuit test” which is carried out on “Type test”.*

Please supplement no-load and short-circuit measurement testing for generator – transformer.

**Answer-1b:** *The no-load measurement testing will be carried out to take a characteristic curve related between a terminal voltage and fuiled current of the generator during the no-load operation with a rated speed.*

- *In case of short-circuit measurement testing of Generator, the generator bus circuit will be connected by the short-circuit copper bar for the three-phases line-leads/conductors of the main generator circuit. And then, the test will be carried out to take a characteristic curve related between armature current (short-circuit current) and fuiled current of the generator.*

*However, it will be definted in the Guidline of Article 93-a1 Characteristic test of Generator in accordance with the result of the study and/ or discussion on the comment of supplement above-mentioned, next stage.*

Explain clearly the fire extinguishing method by using water for generator based on Japanese method.

*Ansewr-1c: In case of Generator of hydro power plant, there are two (2) typical methods for the fire fighting system, such as “Carbon dioxide (CO<sub>2</sub>) fire extinguishing system” and “Automatic Water Spray System”.*

- Major operating principles of the system:

- a. Detecting channels ~ Some thermal detectors, smoke detectors, infrared type detector and/or, generator differential relay, etc.
- b. Manual activation by pressing fire push button,
- c. Control cabinets for auto water spray system,
- d. Water supply units electrically controlled, etc.

*Note: Refer to the requirements of BS3116 and to the Codes 70 to, 90A of the National Fire Protection Association (International) USA. TCVN 5738:1993, TCVN 2622:1995, etc.*

2. Mr. An – Buon Kuop Hydropower Company

Email: [haianatd5@gmail.com](mailto:haianatd5@gmail.com)

Contact number: 0942.400.088

- Please supplement inspection works for oil system (controlling pressured oil, lubricant,...) and evaluation criteria

*Answer-2a: Please refer to “ Volume and Standards for Test, Acceptance and Hand over of Electrical Equipment” (Ministry of Energy No.48 NL/KHKT),*

*There, normally, will be performed to check an allowable limit / analysis of the oil quality for the insulation oil, lubricant oil, control oil, etc in accordance with Manufacturer’s manual.*

*However, this issue will be defined in the Guideline of Article 91 Oil treatment in accordance with the result of the study and/ or discussion on the comment of supplement above-mentioned, next stage.*

- Please provide email address of Working Group members for comment contribution

**Answer-2b: Information for receipt of comments of participants**

*The participants were requested to deliver comments, if any, on the draft of QCVNs before April 1, 2011 by email to the following addresses:*

*pham hong hai [phamhonghai86@gmail.com]*

*vu mai hau [tcktd\_khcn@moit.gov.vn]*

- Please supplement provisions on inspecting overhead travelling cranes and other elevating machinery, such as inspections on static loads and active loads.

*Answer-2c: The overhead travelling cranes (OHTC) will mainly be carried out “Field load test”, as follows;*

- *Running-in-trails with load and without load including inching operation test for the hoisting and lowering direction and/or the vertical movement;*
- *Deflection of the main bridge girders: Test load at 125% of rated capacity. (Deflection of the bridge girders shall be measured and compared with the guaranteed value and rated load test shall be performed for purpose of checking the safety only);*
- *Brake operation tests with maintaining load;*
- *All electrical measurements.*

*( Other elevating machinery may be same test as above, mostly.)*

*So, these issues will be defined in the Guideline of Article 87-a5 overhead traveling crane in accordance with the result of the study and/ or discussion on the comment of supplement above-mentioned, next stage.*

3. Mr. Tran Ki Hai – Buon Kuop Hydropower Company

Email: [tk2atd5@gmail.com](mailto:tk2atd5@gmail.com)

Contact number: 0963.472.611

- Please supplement testing items for insulating resistance measurement for electrostatic equipment in hydropower plant, such as soft starting system, inverter.

*Answer-3a: The insulation resistance measurement of soft starting system, inverter, etc., will, mainly, be carried out following items;*

- *Between Main circuit ~earth;*
- *Between PT(PD), CT~earth;*
- *Between each circuit of electrical equipment and/or earth;*

*(Refer to, IEEE Std 43-2000)*

*However, it will be defined in the Guideline of Article 79 insulation resistance measurement with the result of the study and/ or discussion on the comment of supplement above-mentioned, next stage.*

- In Article 93-a1: Characteristics Testing for generator, regarding “axial voltage measurement”, in fact, we often test function 38 of Protection Relay and measure the current, not the voltage.

*Answer-3b: The shaft current preventing device will, normally, be provided all generator which is specified in the Contract Document.*

- **Shaft current preventing device:** *It will be taken against burning of the bearing metal due to the shaft current. Proper care will be taken not to make asymmetric magnetic circuit.*
- **Adequat insulation** *will be provided at the base of the upper bracket, with cooling water pipes, oil pipes, pressure conduits for thermometers, etc., which may conceivably from closed circuits, if necessary. For confirming the goodness of the insulation by measuring the shaft voltage and insulation resistance, the wiring will be provided up the suitable plases. The position and construction of such insulation will be indicated in the drawings.*
- *However, it will be definted in the Guidline of Article 93-a1 Characteristic test of Generator with the result of the study and/ or descussion on the comment of supplement above-mentioned, next stage.*

4. Mr. Thai Vinh Quoc – Deputy Manager of Quang Tri Hydropower Company

Email: [quoctdqt@gmail.com](mailto:quoctdqt@gmail.com)

Contact number: 0912.397.581

- The Articles in QCVN are so general, not specific enough. Please mention the order/sequence and standards used when testing. For example, testing standards for penstocks.

*Answer-4a:QCVN is mandatory standards, which is described as following Comments on Vol.5 (ETC3). This opinion will be definted on the “Guideline”for each Article, next stage, if necessary.*

(This QCVN provides basic requirements for inspection, so content in the Articles, Parts, and Chapters of this volume only mention the minimum mandatory requirements ensuring big accidents and disasters not to occur. Therefore, the required content shall not be so specific such as: parameters in the tables, allowable limit parameters, evaluation criteria mentioned in the Volume. How to implement those contents or items, what methods, how to evaluate, or particular notes when carrying out each item, all we can refer to the guidelines such as: Testing procedure for electrical equipment, Installation procedure, etc. )

- It’s necessary to have a specific schedule of how to develop Technical Regulations until 2013. Accordingly, assigning tasks for each group: Hydro, Thermal and Network.

*Answer-4b: - Please confirm General information for the schedule until 2013 of JICA Team, explained by Team leader..*

- *Sending the drafts of QCVN will be trayed by JICA Team, If it is acceptable by MOIT & MOC.*

Sending the drafts of QCVN prepared by those three groups to relevant ones to collect comments then holding Workshop that will be more efficient.

- In this QCVN, there are no provisions on vibration of equipment in power house as well as swing (axial swing) of generator.

*Answer-4c: The vibration measurement will be carried out on the head-cover, thrust tank-over, upper-bracket, etc. (with shaft run-off check, if any.) of turbine – generator, mainly. However, if, it is necessary to measure the vibration of equipment in the powerhouse, it will be performed by owner decision. It is not necessary to define in QCVN of mandatory standards. (Refer to answer item 4a)*

5. Mr. Ho Ngoc Tuong - Southern Hydropower Jointstock Company

Email: [grahu44@gmail.com](mailto:grahu44@gmail.com)

Contact number: 0973.102.558

- Part I, Article 2.2: Shall hydropower plants connected to local grid (22kV) comply with this QCVN? As such kind of power plants will develop more in the future.

*Answer-5a: It is proposed in the final draft of revised QCVN Vol.5 and Vol.6 to cover only hydropower plants connected to National Power Transmission Network (over 110kV).*

- Part II, Chapter 3, Article 78: the provisions as ‘Grounding resistance of the power plant is less than  $0,5\Omega$ ’ has any conflicts with the MOIT’s provisions which allowing this grounding resistance up to  $4\Omega$  provided that the earth resistivity  $\rho \geq 500 \Omega.m$ .

*(Answer-5b: It will be discussed the value, (less than  $0.5\Omega$ ) of the grounding resistance of the power plant, later on*

*(Refer to IEEE No. 80-1976 "Guide for Safety in Substation Grounding")*

- Chapters 3 and 4: in-progress inspection and completion inspection: the testing for turbine characteristics (for developing the operation curve line) is not mentioned in these two chapters although this work is already carried out at manufacturing factory. And also Vietnamese standards and IEC both mention about that content.

*(Answer-5c: The turbine characteristics (for developing the operation curve line) will be defined on the “Guideline”, normally. Because,*

*QCVN of mandatory standards will not show detailed instruction for the many turbine characteristics.*

- Testing for noise of generator, motor is not mentioned, as the allowable noise shall be  $\leq 80dB$ .

- *(Answer-5d: The allowable noise for any location is Specified in the Contract Document, generally. There is difference in a value of the allowable noise for each location in the power plant.*

- *It is not necessary to define this matter in QCVN of mandatory standards.*

- Article 90: please add the phrase: “at load models” by the end of the final sentence of the Article.

*(Answer-5e: The load models for the Article 90 Bearing operation/run will be defined in the “Guideline”. The purpose of this test will be taken achieving stable temperature for each bearings with cooling water supply.*

- Article 98: please add this phrase: “of tested turbine” to the sentence- ‘In this case, conduct trial operation at 100% output if at all possible’

*(Answer-5f: This opinion is understood, e.g. it will be shown on the pumping operation of “tested pump-turbine”, However, I think it is not necessary. Anyhow, it will be discussed next stage.*

## 6. Mr. Tri – ETC2

- Article 27: DC resistance measurement: the resistance difference of winding amongst phases is not mentioned? What is formulation?

- Measurement for the current and no-load loss: cannot be carried out at site for high voltage transformers. E.g. 115/23kV or 15/6kV

-Article 28: there is no  $\text{tg}\delta$  measurement item for capacitor-type voltage transformers.

-Article 29:  $\text{tg}\delta$  for current transformer at 110kV level at 20°C: 2% is too high and there is no convert for  $\text{tg}\delta$  according to temperature to 20°C.

## 5. Information for receipt of comments of participants

The participants were requested to deliver comments, if any, on the draft of QCVNs before April 1, 2011 by email to the following addresses:

- 1) pham hong hai [phamhonghai86@gmail.com]
- 2) vu mai hau [tcktd\_khcn@moit.gov.vn]

## 2. Minutes of 1<sup>st</sup> Workshop in Hanoi

**REPORT OF 1<sup>ST</sup> WORKSHOP**  
**ELECTRIC POWER TECHNICAL STANDARDS PROMOTION**  
**PROJECT IN VIET NAM**  
**HYDROPOWER GROUP**  
Ha Noi, 15 March 2011

### 1. General

In order to deploy the project of promoting and enhancing Vietnam electric power technical standards, which is the co-operation between the Ministry of Industry and Trade (MOIT), the Ministry of Construction (MOC) and Japan International Cooperation Agency (JICA), dated March 11<sup>th</sup> 2011, under the presiding of the Ministry of Industry and Trade and the Ministry of Construction, JICA held the first workshop in HCMC. The purpose of this workshop is to introduce and collect suggestions from Electrical operation organizations in Central and Southern areas for volumes 5 and 6 of QCVN – QTD as well as for the new volume for the design, construction and completion inspection of hydropower civil works under MOC.

### 2. Participants

- MOIT: Mr. Nguyễn Hải Dũng

- MOC: Mr. Vũ Hữu Hà

Các đại diện của các nhà máy điện và các đơn vị hoạt động điện lực sau đây:

| Tên                  | Tên cơ quan, đơn vị              |
|----------------------|----------------------------------|
| Nguyễn Khắc Thục     | Hòa Bình HPP                     |
| Nguyễn Thị Bích Liên | Hồ Bón HPC                       |
| Nguyễn Văn Trịnh     | Thác Bà HPC                      |
| Nguyễn Huy Hoạch     | PECC1                            |
| Nguyễn Văn Minh      | Vinaconex P&C jointstock company |
| Nguyễn Tiến Vũ       | Hydropower management board 2    |
| Đậu Ngọc Ninh        |                                  |
| Vũ Văn Tinh          | Tuyên Quang HPC                  |
| Nguyễn Đức Trọng     | Hương Sơn HPC                    |

### **3. Content**

Contents of meeting

#### **3.1. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.5 in construction, civil work and hydromechanical**

-Modify in Article 2: Scope of application

-Modify in Article 74: classification of hydropower plant from the classification in TCVDVN-285 to those stipulated in QCVN 03: 2009/BXD.

-Modify in Article 100: Frequency of periodic inspection

The frequency of periodic inspection for waterways was newly proposed to be “every 6 years or more frequently” instead of every 3 years more frequently for other structures and equipment. (JICA’s opinion)

#### **3.2. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.5 in Electrical part**

- Changing in arrangement of chapter 3 – Hydropower plant:

Chapter 3 shall be separated in 4 sections by adding Section 4 “Power Plant Equipment (PPE)” to the original edition as follows:

Section 1: Generator/Generator-motor

Section 2: Turbine/Pump-turbine ~~Motor~~

Section 3: Auxiliary equipments of Turbine/Generator

Section 4: Power plant equipment

- Presenting about detail changing in Vol.5 chapter 3, testing items was separated into 2 types:

- Dry test: testing in in-progress

- Wet test: testing after finishing the installation

- Presenting about changing and addition in these Article 74,79, 80, 81, 82, ...

#### **3.3. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.6 in construction, civil work and hydromechanical**

- Modify in Article 2: Scope of application

And changing in other Articles. Article 63, 64, 65 were moved to guideline

Changing and addition in Article 70.



### **3.4. Represent changing and modify in 2<sup>nd</sup> draft of QCVN Vol.6 in Electrical part**

There were 2 changes in Article 91 and Article 98.

Explanation about the difference between 2 terminologies “runner pit” and “turbine pit” .

Addition Article 99.

### **3.5. Representative about draft of QCVN in construction of hydro civil work which was presented by MOC**

- Presenting about background and direction of project
- Presenting about arrangement and main contents in document.

### **4. Questions for Discussion**

During the workshop, these organizations contributed the following opinions for volumes 5 and 6 of QCVN.

1. Mr. Nguyễn Văn Trịnh –Thác Bà HPC

- Name of project “Electric Power Technical Standards Promotion in Viet Nam” , so that, why we must be promoted the technical standards in Viet Nam while we have already had technical regulations in Viet Nam?

Answer: Mr. Nakamura- “Promotion” is to making the application of technical standards in Viet Nam to be better and have more effective.

- About the frequency of periodic inspection: Between hydropower plants in Viet Nam have many different in technologies and equipments therefore if the frequency of periodic inspection is 6 year (as JICA’s opinion), It will be not accommodate with the actual conditions of each hydropower plant.

Answer: Mr. Nakamura – Frequency of periodic inspection is 6 year as shown out is the maximum duration between 2 times of periodic inspection. It may be shortened for accommodate with each hydropower plant.

- In Article 82. dielectric loss angle, absorption current and polarity index

$R_{60}/R_{15}$ : the value of insulation resistance is not stable after 15 seconds

Answer: translating error (word by word translate). The value of insulation resistance must be taken at 15s and 60s.

- Clause “Fire extinguisher” is not familiar.

Answer: translating error. (word by word translate)

2. Ms. Nguyễn Thị Bích Liên –Hồ Bốn HPC

In 2.2, Article 2 .Part I.Vol.5 – Scope of application

If this technical regulation is applied to all of hydropower plant, It will be very difficult for small project to acceptance and connect with Vietnamese grid.

Answer:

It is recommended also for small scale project to apply the regulations if such project is connected to the National Power Transmission Network (>110kV).

3. Mr. Nguyễn Huy Hoạch – PECC1

- The translation of the draft technical regulations is not accurate, request modifications from editors team and invite experts in hydropower field to edit specific terms.

Answer:

The importance of the translation is understood. However, it is difficult ckeck the quality of Vietnamese version by JICA Team. So, the involvement of Vietnamse side members is necessary for finalization of Vietnamese version.

- In page 10 of the proposal (slide 123), what is the basis to propose the construction classification as in proposal (TCXDVN 285-2002, 209/2004/NĐ-CP or ) which is different from the construction classification and statistics introduced by JICA.

Answer: this issue is caused by the inability to modify those slides in time. The statistics introduced by JICA has been referenced in 209/2004/ NĐ-CP, JICA absolutely did not render any new statistics (QCVN 03-2009/BXD), but they have refered to the existing latest regulations in Vietnam.

## **5. Information for receipt of comments of participants**

The participants were requested to deliver comments, if any, on the draft of QCVNs before April 1, 2011 by email to the following addresses:

3) pham hong hai [phamhonghai86@gmail.com]

4) vu mai hau [tcktd\_khcn@moit.gov.vn]

### 3. Minutes of 2<sup>nd</sup> Workshop in HCMC

|   |  |
|---|--|
| Date:   | 22nd June 2011 8:30~17:00  |
| Participant   | MOIT Mr. Kim, Mr. Dzung, Mr. Hien<br>EVN (Vietnam Electricity) Mr. Tien and others<br>ETC (Electrical Testing Center) Mr. Khiem, Mr. Trung and others<br>PECC2<br>SHJSC<br>Thac Mo HPP |
| Venue   | Caravelle Hotel  |
| JICA Team   | Nakamura, Okada, Mizuhashi, Umesaki  |
| Contents: 2 <sup>nd</sup> Work Shop in HCMC   |  |
| <p>Discussion Contents:</p> <p>JICA Hydro Team explained WS report (power point files) about revised Technical Regulation. Vietnamese participants stated following comments.</p> <p>1. MOC regulation</p> <ul style="list-style-type: none"> <li>- Special class shall not be in the scope of application and shall follow the classification and other provisions in TCXDVN-285-2002 but not follow QCVN-2011/BNN which has not been promulgated yet. For example, criteria of design flood and check flood become much smaller than that of TCXDVN-285-2002. (From PECC2)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>As QCVN-2011/BNN has been already approved and will be promulgated within this year, we shall follow the provision of QCVN-2011/BNN but not TCXDVN-285-2002 as instructed by MOC.</p> <p>Classification by reservoir capacity is almost equivalent each other between TCXDVN-285-2002 and QCVN-2001/BNN although classification by the plant capacity (MW) is changed drastically.</p> <ul style="list-style-type: none"> <li>- Article 84 "Pressurized Waterway", Item 6 "Steel Penstock": "Pressure test" shall be included in the test items. (from SHJSC)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>QCVN stipulates only basic or minimum requirements and the pressure test is not conducted usually in Japan and other countries, so that specific test items are not stipulated in the preliminary final draft. The stipulations of final draft will be considered after discussion at the WG meeting.</p> <ul style="list-style-type: none"> <li>- Article 94 "Gate Hoist": "Load Test" shall be included in the test items. (from SHJSC)</li> </ul> |  |

- Part 5 Section 5 "Powerhouse" and Section 2 "Dam": Requirements related to architectural appearance of powerhouse and dam shall be stipulated as it is related to tourism of the power plants. Stipulation shall be "Design and construction of dam and powerhouse shall be conducted taking into consideration the natural conditions to accomplish appropriate architecture to contribute to other benefit of the national economy". (from EVN)

JICA Project Team answered as follows.

The architectural appearance is on the responsibility of the project investor in general, so that it is not appropriate to include provisions of architectural appearance in the mandatory technical regulations.

## 2. Vol.5

- Periodic Inspection for Dam Safety: Article 100-a5 "General provision" and Article 100-a6 "Frequency of inspection": The provisions of these articles shall follow Circular No.34/2010 of MOIT. (from PECC2)

JICA Project Team answered as follows.

Provisions of Circular No.34/2010 will be confirmed and Article 100-a5 and 100-a6 will be revised accordingly, if necessary.

- Article 100-a5 "General provisions": Protection of downstream of dam is stipulated in item 6 of Article 100-a5 following the provisions in Circular 34/2010. (from MOIT)

JICA Project Team answered as follows.

Provisions of Circular No.34/2010 will be confirmed and Article 100-a5 and 100-a6 will be revised accordingly, if necessary.

- Article 76 "Management of operation and maintenance": It is recommended to add measurement of water level at powerhouse downstream. (from PECC2)

JICA Project Team answered as follows.

It is understood that the water level of powerhouse downstream affects the output of power plants which is related to stability of power supply.

- Article 100-a5 "General provisions", Item (1) : It is recommended to follow the provisions in Circular No.34/2010.

JICA Project Team answered as follows.

Provisions of Circular No.34/2010 will be confirmed and Article 100-a5 and 100-a6 will be revised accordingly, if necessary.

- It is recommended to clarify abbreviation and acronym. For example, GCB in Article 30 of Vol.5 is not clear. (from SHJSC)

JICA Project Team answered as follows.

Abbreviations and Acronyms shall be checked in the final draft.

- Some articles such as Article 30 provide very detailed stipulations, while Articles related to hydropower electrical equipment in Part 3.

JICA Project Team answered as follows.

The deepness of the provisions shall be determined based on the practical requirement in each Article or each Part.

- Article 87-a5 "Overhead traveling crane": This article shall be supplemented by adding the stipulation related to requirements by MOLISA (Ministry of Labor - Invalids and Social Affairs).

JICA Project Team answered as follows.

This article will be defined detailed explain in the Guideline including MOLISA, if any.

- Article 123 "Frequency of periodic inspection": Some items are missing in Table 123-1. As it is difficult to cover all items in this table, it is recommended to make the table simpler.

JICA Project Team answered as follows.

The table is shown on major equipment, only. The comment is not clear which item is missing in the Table 123-1.

### 3. Vol.6

- Article 80 "Operating manuals for spillway": Dry test of spillway gates and checking of downstream water level are required before flood season according to Circular No.34/2010. (from PECC2)

JICA Project Team answered as follows.

Provisions of Circular No.34/2010 will be confirmed and Article 80 will be revised accordingly, if necessary. A provision regarding a dry test for spillway gates will be added to Article 100-a4 based on Article 10 of Circular No.34/2010/TT-BCT.

- Water levels at downstream of dam and spillway and downstream of powerhouse (outlet) shall be measured as the water level of powerhouse downstream affects output of power plant and discharge. (from PECC2)

JICA Project Team answered as follows.

It is understood that the water level of powerhouse downstream affects the output of power plants which is related to stability of power supply.

- Article 88 "Survey of operating conditions and criteria": Dry test and wet test shall be clearly stipulated in this Article according to the provisions of Circular No.34/2010.

JICA Project Team answered as follows.

Provisions of Circular No.34/2010 will be confirmed and Article 100-a5 and 100-a6 will be revised accordingly, if necessary.

- Article 14 in VN version is different from English version. (from Thac Mo HPP)

JICA Project Team answered as follows.

VN version shall be checked.

Measures corresponding to the comments and a work schedule ward the final version of technical regulations will be discussed in the working Group Meeting held on June 30.

Concluded

#### 4. Minutes of 2<sup>nd</sup> Workshop in Nha Trang

|   |   |
|---|---|
| Date:   | 24th June 2011 8:30~17:00   |
| Participant   | MOIT Mr. Kim, Mr. Dzung, Mr. Hien<br>EVN(Vietnam Electricity) Mr. Tien and others<br>ETC(Electrical Testing Center) Mr. Khiem, Mr. Trung and others<br>PECC4<br>CPC<br>Buon Kuop HPP<br>Se Sang HPP |
| Venue   | Sunrise Hotel Conference room   |
| JICA Team   | Nakamura, Okada, Mizuhashi, Umesaki   |
| Contents: 2 <sup>nd</sup> Workshop in Nha Trang   |   |
| <p>Discussion Contents:</p> <p>JICA Hydro Team explained WS report (power point files) about revised Technical Regulation. Vietnamese participants stated following comments.</p> <p>1. MOC regulation</p> <ul style="list-style-type: none"> <li>- How to apply American Standards which is option? (from CPC)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>As applied in Son La HPP, American Standards can be applied on the condition that VN regulation shall be also satisfied.</p> <ul style="list-style-type: none"> <li>- It is recommended to apply both VN standards and American standards for Special class as applied for Son La HPP and only apply VN standards for other class. (from PECC4)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>It is not necessary to apply both VN regulation and American Standard but the designer can select American standard on the condition that VN regulation shall be also satisfied.</p> <ul style="list-style-type: none"> <li>- It is recommended to stipulate "overload factor" in Appendix-E. (from PECC4)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>Concept and framework of the VN regulation and American standard is different each other, they cannot be compared simply by load factors and it differs case by case which regulation or standard gives safer condition.</p> <ul style="list-style-type: none"> <li>- - It is recommended to add a schematic figure for Table E-2 to understand the stipulation more clearly. (from PECC4)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>Provision of schematic figure will be studied.</p> <ul style="list-style-type: none"> <li>- - It is recommended to apply MCE in Table E-6 for extreme case. (from PECC4)</li> </ul> <p>JICA Project Team answered as follows.</p> <p>Application of MCE will be explained in Guideline.</p> |   |

- How the class of work is determined? It is recommended to provide clear criteria for determination of class of hydropower project. (from PECC4)

JICA Project Team answered as follows.

Class is determined following stipulations after Table B-2 of Appendix-B in general. Also, higher class among the classes of some criteria shall be applied in general, except that class by reservoir capacity has priority over the class by dam height.

- Article 1 "Scope of Application": It is recommended to make the sentence to state more clearly about the scope of application. (from PECC4)

JICA Project Team answered as follows.

Sentence will be revised taking into account the recommendation.

- - Article 3 "Nomenclatures and Definitions" Item 15: As the all hydropower plants has reservoir or regulating pond, the definition of "reservoir" in item 15 is not clear. (from PECC4)

JICA Project Team answered as follows.

The definition of "reservoir" will be studied and revised if necessary.

- - Article 3 "Nomenclatures and Definitions" Item 15: The definition of "reservoir" in item 15 is not clear. (from PECC4)

JICA Project Team answered as follows.

The definition of "reservoir" will be studied and revised if necessary.

- - Appendix-B, Item 3: It is recommended to state item 3 simpler to make the provision clear. (from PECC4)

JICA Project Team answered as follows.

The description of Item 3 in Appendix B will be studied and revised if necessary.

## 2. Vol.5

- It is recommended to move item 2. of Article 80 "Dielectric test" to Guideline. (from ETC1)

JICA Project Team answered as follows.

JICA Team follows this comment.

- It is recommended to revise an Article 82 "Dielectric loss angle and absorbed current" which will be delete "absorbed current". (from ETC1)

JICA Project Team answered as follows.



JICA team followed a comment from EVN Hoa Binh HPP on previous Workshop.

- It is recommended to add Article 83-a3 "DC resistance measurement" for convenience for bus connection. (from ETC1)
- It is recommended to add Article 83-a4 for checking priority of stator and rotor separately.

JICA Project Team answered as follows.

Though, this comment is one of the field test of the generator. QCVN will be not necessary to define all site test items. It will be defined in the Guideline to have relation to Article of Generator.

- Part 2 Articles related to substation equipment: It is recommended to add provisions related to protection of lightning of substation. (from EVN)

JICA Project Team answered as follows.

As the substation of categorized in the network facilities, it is recommended to discuss this matter with Network Group.

- Article 100-a7 "Recalculation of flood": It is not impractical to recalculate the flood discharge capacity as it has been designed in the design. Therefore, it is recommended to review reservoir operation process. (from Buon Kuop HPP)

JICA Project Team answered as follows.

As pointed out, the flood discharge capacity cannot be changed in general, the stipulation will be reviewed and revised appropriately to give more practical provision.

- Article 92 "Load and input rejection tests" and Article 93 "No load no excitation test": It is recommended to change the order of Articles 92 and 93 following the practical order of tests for dynamic balancing inspection. (from Buon Kuop HPP)

JICA Project Team answered as follows.

As Technical Regulation Vol.5 is not the document to stipulate the procedure of testing but the regulation that provides basic requirements mainly for safety, the Articles in Vol.5 are not stipulated in order of practical testing. However, the order of Articles will be reviewed and revised if appropriate.

- Article 96 "Load and input tests" and Article 97 "Output test": It is recommended to add a provision for calculation of efficiency. (from Buon Kuop HPP)

JICA Project Team answered as follows.

The both Articles are not related efficiency test directly.

- Article 98-a1 "Vibration measurement": It is recommended to supplement this Article by providing stipulation for shaft run out test. (from Buon Kuop HPP)

JICA Project Team answered as follows.

Technical Regulation stipulates only the minimum requirements and it is not practical to apply the same mandatory requirements for all types of hydropower equipment. Therefore, retails such as shaft run out test will be described in Guideline.

- Article 98-a1 "Vibration measurement": It is recommended to delete the provision of vibration measurement and stipulate in the Guideline. Instead, it is recommended to provide a provision for over speed test which is required for calculation of bearing capacity of equipment. (from Se Sang HPP)

JICA Project Team answered as follows.

As Technical Regulation Vol.5 is not the document to stipulate the procedure of testing but the regulation that provides basic requirements mainly for safety, the Articles in Vol.5 are not stipulated in order of practical testing. However, the order of Articles will be reviewed and revised if appropriate.

- Article 72-a3 "The Inspection for Power Capacitor": The number of Article which is referred in Article 72-a3 is not correct. (from PECC4)

JICA Project Team answered as follows.

The number of reference Article shall be checked and corrected in the Final Draft.

- Part 2 Appendix-1 "Test Voltage for Withstand Voltage Test": The title of the 3rd column of the table is not appropriate and shall be corrected applying an appropriate description. Also, the term of "operating voltage" in the third column is not clear. It is recommended to provide clear description for this. (from PECC4)

JICA Project Team answered as follows.

As the Part 2 Appendix-1 of categorized in the network facilities, it is recommended to discuss this matter with Network Group.

Measures corresponding to the comments and a work schedule ward the final version of technical regulations will be discussed in the working Group Meeting held on June 30.

Concluded

## 5. Minutes of 2<sup>nd</sup> Workshop in Hanoi

|   |   |
|---|---|
| Date:   | 28th June 2011 8:30~17:00   |
| Participant   | MOIT Mr. Hien<br>MOC Dr. Ha<br>MARD<br>EVN(Vietnam Electricity) Mr. Tien<br>ETC(Electrical Testing Center) Mr. Trung<br>Invited<br>VNCOLD<br>PECC1<br>Hoa Binh HPP and other participants |
| Venue   | Melia Hanoi Hotel   |
| JICA  | Hanoi Murakami<br>Project Team Nakamura, Okada, Mizuhashi, Umesaki  |
| Contents: 2 <sup>nd</sup> Work Shop in Hanoi  |   |
| <p>Discussion Contents:</p> <p>JICA Hydro Team explained WS report (power point files) about revised Technical Regulation. Vietnamese participants stated following comments.</p> <ol style="list-style-type: none"> <li>1. MOC regulation <ul style="list-style-type: none"> <li>- A dam breach flood analysis shall be prepared in regulations. (from VNCOLD Mr. Dai)</li> <li>- In the Son La hydropower project, PMF was applied to the check flood, and new seismic criterion and dam stability analysis were applied to seismic design of a dam. (from VNCOLD Mr. Dai)</li> <li>- A calculation method used in safety analysis of the Son La Dam shall be adopted as a technical regulation.(from VNCOLD Mr. Dai)</li> <li>- Power generation and irrigation shall be considered for determination of reservoir capacity. (from VNCOLD Mr. Dai)</li> <li>- Measures to mitigate influence to the downstream area shall be provided as this technical regulation includes power generation and irrigation, which are not stipulated.(from VNCOLD Mr. Dai)</li> <li>- Article 3: Definition of dams and technical terms "design flood" and "check flood" is different from those in Vietnam. (from VNCOLD Mr. Dai)</li> <li>- Article 20: Definition of reservoir water level is different from those in Vietnam. (from VNCOLD Mr. Dai)</li> <li>- This technical Regulation shall conform to TCXDVN-285 and technical standards of Son La Hydropower Project. (from VNCOLD Mr. Dai)</li> <li>- There are no provisions on the master plan of a cascade development plan of rivers though these are important. (from VNCOLD Mr. Dai)</li> </ul> </li> </ol> <p>→Set up of the master plan is already provided as a rule.(MOIT Mr. Hien)</p> |   |

- There are differences of design conditions for waterways between TCXDVN-285 and QCVN-2011 and these shall be unified. Design conditions shall be unified and not divided into structures such as dams , waterways and other structures. (from VNCOLD Mr. Tin)
  - The scope of TCXDVN-285 is power generation and that of QCVN-2011 includes power generation and irrigation. This technical regulation shall stipulate mainly waterways. (from VNCOLD Mr. Tin)
  - Article 1: In paragraph 4, it shall be clarified if this regulation is applied to the structure which satisfies both installed capacity and existence of reservoirs. (from VNCOLD Mr. Tin)
  - Article 3: In paragraph 25, a class of concrete specimen shall be defined. (from VNCOLD Mr. Tin)
- A method of unconfined compressive strength of concrete shall follow industrial standards of each country.
- Article 7 Geological investigation: Paragraphs 1 and 3 shall be unified. Russian technical regulations are based on different concept from American technical regulations and these two regulations give different calculation results, so contents of the article are not proper. A standard quantity of investigations shall be described according to the Sectoral Standard 195 and 196. (from VNCOLD Mr. Tin)
  - Article 10 Requirements on Dam Stability: This article also provides durability, which is different from the title.(from VNCOLD Mr. Tin)
  - Article 14: Paragraph 2 shall be deleted as it is redundant. (from VNCOLD Mr. Tin)
  - Article 14: Paragraph 3 shall consider not only constructional solutions but also non-constructional solutions. (from VNCOLD Mr. Tin)
  - Article 18: Two tables shall be unified into one. (from VNCOLD Mr. Tin)
  - Chapter 2 does not stipulate safety factor and shall stipulate them according to TCXDVN-285. (from VNCOLD Mr. Tin)
  - Article 22: Provisions are not proper as a technical regulation. Freeboard shall be same for concrete dams and fill dams. (from VNCOLD Mr. Tin)

- Article 46: Necessity of surge tanks shall be evaluated both from technical and economical point of view. (from PECC1)
- Article 54: Requirements in Reservoir and Surrounding Area: As for the Paragraph 3, the elevation of backwater is higher than the dam crest in some cases, so it is not proper to provide the reservoir area by the dam crest elevation. (from PECC1)
- Article 54 is provided for administration and not necessary (from MOC Dr. Ha)
- Article 25 Dam Foundation, Article 30 Foundation for Concrete Dam and 35 Foundations for Fill Dams: Contents of these articles are repeated. (from MARD)
- Contents of this Technical Regulations and QCVN-2011 are repeated and the scope of this regulation shall be waterways and other civil structures. (from MARD)
- Requirements of Master Plan of cascade development, which is indispensable for the hydropower development shall be stipulated in the regulation. (from VNCOLD)
- Inter-operation of cascade reservoirs is important.
- Article 3 Nomenclatures and Definitions, Paragraph 25: New definition for grade of concrete to be determined sample test shall be provided. (from VNCOLD Mr. Tin)

JICA Project Team answered as follows.

A test method for unconfined strength of concrete shall be based on industrial standards in each country.

## 2. Vol.5

- Article 74: A definition of a reservoir is not clear. (from PECC1)
- Article 74: There are two kinds of spillway, a spillway for a dam and for a headtank respectively, and two different words are applied to each structure in Vietnamese. (from PECC1)
- Article 105, 111, 120 and others: The words "excessive", "severe" and "serious" shall be defined and deteriorations shall be quantitatively expressed. (from PECC1)

JICA Project Team answered as follows.

It is difficult to evaluate the extent of deterioration quantitatively as conditions vary in each project site.

Other participants explained as follows.

→QCVN stipulates general requirements and not specific matters, so qualitative expression is

applied in this Technical Regulation. (from EVN Mr. Tien)

→Provisions of technical regulations shall be described clearly in order to evaluate conditions of structures. There are two ways of regulation, one is to describe quantitative regulations and the other is to refer to existing regulations. (from MOC Dr. Ha)

→It is recommended that vague expressions should not be used in technical regulations.

- Article 105 and others: A definition of "excessive", "severe" and "serious" shall be clarified, otherwise an inspector and an owner will dispute interpretation of these words. (from PECC1)

JICA Project Team answered as follows.

These words may be applied to the extent of deterioration which damage safety of hydropower civil structures.

- Article 99: The owner has the right to file a complaint against the decision of the Authority on field inspection. (from MARD)

→This comment is approved. (from MOIT Mr. Hien)

JICA Project Team answered as follows.

If this comment is approved, this sentence should be deleted.

- Article 100-a9: An item "No damage in the joint of concrete slab" shall be added to the paragraph 1. (from MARD)

JICA Project Team answered as follows.

This provision will be added to the article.

- Article 100-a9, 100-a10: Amount of seepage from dam foundation can be regulated by seepage calculation. (from MARD)

JICA Project Team answered as follows.

Amount of seepage from dam foundation can be calculated but it is difficult to evaluate safety of a dam by only amount of seepage as geological conditions and material properties differ in each project site.

- Article 106: An item "Inspection of no leakage or seepage on side slope or bottom of channel that exceed the limitation of the design criteria" shall be added to inspection. (from MARD)

JICA Project Team answered as follows.

Project Team will study adoption of this provision to the article.

- Article 74 Definitions: Definition of "Reservoir" is not correct. (from PECC1)
- Article 74 Definitions: There are 2 kinds of Spillway for which different terms are used in Vietnam. One is the spillways for flood discharge and the other is spillways of headtank. (from PECC1)

3. Vol.6

- Article 78: An item "water discharge regime for downstream area" shall be added." (from MARD)

JICA Project Team answered as follows.

Project Team will study adoption of this provision to the suitable part of Vol.6.

- Operation criteria or operation procedure for inter-control of reservoirs in cascade shall be stipulated in the Regulation. (from VNCOLD Mr. Dai)

Mr. Tien of EVN and Mr. Hien of MOIT answered as follows.

Regal documents are already available for inter-control of reservoirs in cascade in Vietnam. (from EVN Mr. Tien and MOIT Mr. Hien)

QCVN is not required to cover all aspects. (from MOIT Mr. Hien)

- Other comments on Vol.6 will be submitted in writing. (from VNCOLD Mr. Dai)

Measures corresponding to the comments and a work schedule ward the final version of technical regulations will be discussed in the working Group Meeting held on June 30.

Concluded

## 6. Minutes of 3<sup>rd</sup> Workshop in HCMC

### HCMC 3rd Workshop Meeting (Hydropower Group)

|  |  |
|--|--|
| Date :   | 26th October, 2012   |
| Participant  | MOC: Dr. Ha<br>MOIT : Mr. Hoa<br>EVN(Vietnam Electricity): Mr. Tien, Mr. Ngoc<br>ETC(Electrical Testing Center): Mr. Trung<br>CRA (Center for Water Resource & Eng. Application): Ms. Thuy<br>Hydropower power companies in the southern region (Dong Nai 3&4, Can Don, Da Nhim-Ham Thuan-Da Mi, Tac Mo)<br>PECC2, PECC3 and PECC4<br>ETC2, Vinaconsult. |
| Venue  | CARAVELLE Hotel, Meeting Room (Opera I-II)   |
| JICA   | Hydro Team: Mr. Nakamura, Mr. Mizuhashi, Mr. Umesaki and Mr. Okada<br>Ms. Thao (Interpreter)   |
| <b>Contents: Breakout Session of Hydropower Group</b>  |  |
| <p>Discussion Contents :</p> <p>1. Breakout Session A-1</p> <p>CRA explained revised MOC Technical Regulation and JICA Hydro Team explained outline of MOC Technical Regulation Guideline.</p> <p>Vietnamese participants stated the following comments.</p> <p><u>Comments of MOIT (Mr. Hoa):</u></p> <ul style="list-style-type: none"> <li>➤ Some part of the contents at the presentation is conducted by way of comparison with TCXDVN285 : 2002, but comparison with QCVN04-05 is more suitable.</li> <li>➤ Contents on the current version conform to stipulations in the QCVN of MARD, but it is also necessary to conform to stipulations in the Decrees of MONRE or Government such as Decree No.112 (management, protection and general exploitation the resources and environment of hydraulic and irrigational reservoirs) and No.120 (River Basin Management).</li> <li>➤ The scope of application is not clear. It is clear when the power plant has a dam, the power plant have to obey the regulations. But if the generating output is more than 30MW but the plant does not have any dams, it is unclear whether the plant is included or not.</li> </ul> <p>→ (Answer of MOC Dr. Ha) This Technical Regulation is applied to the hydropower plants which have dams and their maximum output is over 30MW, and others are recommended to obey.</p> <ul style="list-style-type: none"> <li>➤ It is hard to understand the stipulation about highest class in Article 4.2.3.</li> </ul> |  |



- It shall be clear if this Technical Regulation is applied only to newly constructed hydropower plants and large scale renovation.
- (Answer of MOC Dr. Ha) This Technical Regulation is applied to new construction or expansion of hydropower plants and not existing ones.
- There are some contradictions regarding flood prevention measures between the Technical Regulations and current conditions at some existing dams. How about application of PMF?
- The stipulation in Article 7.13 “Daily storage reservoir” has contradictions with current stipulation in Decree of MONRE. (The Decree stipulates that the discharge volume depends on the class of the power plant.)
- The requirements on downstream flood protection are acceptable in general although applications are ambiguous. They shall be clarified in the Guideline.
- TCXDVN285:2002 and QCVN 04/05 stipulate that a hydraulic model test shall be conducted for hydropower facilities with Class II and Class I, respectively, and that it is not necessary to conduct a test for facilities lower than those classes, however, techniques which are not introduced into Vietnam shall be confirmed by a hydraulic model test.
- Some contents of draft QCVN such as classification and requirements of model test were eased comparing with the stipulation in TCXDVN285:2002, but the safety matters shall not be eased.
- The stipulation in Article 7.14.4 is not suitable to stipulate in the Technical Regulations. Article 7.14.4 stipulates that all hydropower works from grade II and above shall install bottom outlet work, however, it shall be clear if this provision is applied to existing facilities. It is necessary to investigate the actual situation of existing dams for considering appropriateness of this requirement in the Technical Regulation, if the requirement is applied to the existing dams.
- Stipulations in Decree 72 shall be reflected to the contents regarding monitoring device system stipulated in article 7.16.1.

Comments of PECC2 (Mr. Cuong):

- The words such as “investigator” and “consultant” appeared in the draft QCVN are

recommended to be deleted.

- The stipulations regarding design and check flood shall be replaced with those of Russian technical regulations which is more understandable. Current stipulations cannot be applied to the low class works.
- Regarding flood protection in the area downstream a dam, an extent of damage and damage itself shall be defined.
- Some safety factors are severer than the current safety factors stipulated in TCXDVN285 : 2002. It shall be clarified how they are applied to the projects for which design has been completed but they are not constructed yet.
- Article 6.2 stipulates that the data of natural conditions shall refer to QCVN 02: 2009/BXD. However, this stipulation is not suitable. Because the purpose of QCVN 02: 2009/BXD is to formulate the master plan in provincial area.
- Contents regarding rock fill dam shall be added before concrete gravity dam part in Appendix C. 1.1.3
- There are some incorrect translations from English to Vietnamese in Table C-6 of Appendix C.1.5.1 such as the Vietnamese words for “rapid drawdown”.

## 2. Breakout Session A-2

JICA Hydro Team explained outline of the 2nd draft of Guidelines for Technical Regulation Vol.4 .

Vietnamese participants stated the following comments.

- (Thac Mo HPP) We did not confirm contents of CD-R documents, so we misunderstood that we received Technical Regulation and Guidelines only regarding civil structures. We will send comments by e-mail.

(Other participant) We could not open files saved in CD-R.

→ The host organization sent documents of Technical Regulation and Guidelines Vol.4 and 5 by CD-R, so participants should have read them.

- (PECC2) It is desirable that a list of taking over items of information including conditions

of each device in a powerhouse in changing a shift should be prepared.

- It is not necessary to record all conditions of each device in a powerhouse in a diary for shift workers. Only special mentions such as abnormalities in facilities shall be recorded.
- Such an inspection is not dealing with in current version. JICA team presumes when the equipment is something in trouble, only such matter shall be taken over between operators.
- (Can Don HPP ?) The threshold shall be added regarding contents in Tables 50-1, 50-2 and 50-3.
- Whether the phenomenon existed or not is the purpose of the measurement. If the abnormal result is found, the investigation for the cause is needed.
- (Can Dong HPP) It shall be confirmed what are thresholds of deformation and water leakage in a dam and what measures shall be taken in case those observed values exceed thresholds.
- There are no clear thresholds. In case these values become more than those in the previous inspection, their cause shall be investigated and measures shall be taken.
- (Can Dong HPP) It shall be confirmed what are thresholds of uplift upstream and downstream of the curtain grouting line.
- In case values of uplift become more than design values, their causes shall be investigated by comparing with other monitoring items such as deformation and displacement of a dam body and measures shall be taken after comprehensive evaluation.

### 3. Breakout Session A-3

JICA Hydro Team explained outline of the 2nd draft of Guidelines for Technical Regulation Vol.5.

Vietnamese participants stated following comments.

- (Ham Thuan and Da Mi HPP) Regarding Article 98-a1, it shall be confirmed if values in Table 98-a1-1 are applied to vibration tests compulsorily or just for reference.
- Values in Table 98-a1-1 are reference for vibration tests.
- (Da Mi HPP) Regarding Fig.90-1 in Article 90 “Bearing operation/run”, it seems dangerous to start test operation from 25% of rated revolving speed.
- It is usual to start test operation from low revolving speed to confirm safety in case of initial installation and after repair of a bearing, which is common in technical regulations and specifications of each country.

- (Da Mi HPP) Time for moving to the next revolving speed shall be described in Guideline.
  - Time required for moving to the next revolving speed depends on characteristics of a turbine. In an actual case, revolving speed shall be increased after confirming non-existence of abnormalities described in Article 90.
  
- (PECC2) It is desirable that a list of visual inspection items for civil structures and electrical equipment should be described in Guidelines.
  - Visual inspection items are included in those for civil structures. Most of inspection items for electrical equipment are related to tests of equipment, and it will be considered if visual inspection items should be added to the existing items.
  
- (PECC2) It shall be confirmed if there are any stipulations regarding maintenance procedures for standby power supply.
  - The stipulation is in Article 116. The specific maintenance procedure shall be decided by owner, because the structure of each standby power supply varies widely.
  
- (ETC2) Frequency of periodic inspection for electrical equipment is three years in Guideline, which shall be coordinated with that in EVN's regulation.
  - Frequency of periodic inspection for electrical equipment will be re-considered.
  
- (ETC2) Regarding Article 123 "Frequency of periodic inspection", Table 123-1 is not shown in Guideline.
  - Table 123-1 is shown only in the article of Technical Regulation, and a layout of Guideline will be revised.
  
- (PECC 3) Regarding paragraph 2. of Article 92 "Load and input rejection tests", supplemental explanations shall be added to the sentence "at the same time with the time interval difference model".
  - This provision regulates how to set a time interval of load rejection for more than one units connected to one line of penstock so that the severest conditions may be given to penstock and draft tubes. Article 92 of Guideline will be revised to provide clearer explanation.

Mr. Hoa (MOIT):

Mr. Hoa announced that the participants were requested to send further comments to MOIT by email.

Concluded

## 7. Minutes of 3<sup>rd</sup> Workshop in Hanoi

### Hanoi No.3 Workshop Meeting (Hydropower Group)

|  |  |
|--|--|
| Date:  | 30th October, 2012   |
| Participant  | MOIT : Mr. Hien (General Directorate of Energy)<br>MOIT: Ms. Thuy, Mr. Gian (Environment Safety Dept.)<br>EVN(Vietnam Electricity): Mr. Tien, Mr. Ngoc<br>ETC(Electrical Testing Center): Mr. Thanh, Mr. Trung<br>CRA: Assoc. Prof. Dr.Vinh<br>Tac Ba HPP,<br>Large Dam Association,<br>PV Power,<br>Institute for Energy Science,<br>Northern Power Corporation,<br>Electric Power University of VN,<br>Vietnam Hydraulic Engineer Consultants Corporation-JSC (HEC),<br>Institute of Energy (IE),<br>Tuyen Quang HPP,<br>Institute for hydropower and renewable energy |
| Venue  | Melia Hanoi Hotel, Thang Long Ballroom   |
| JICA   | Hydro Team Mr. Nakamura, Mr. Mizuhashi, Mr. Umesaki and Mr. Okada<br>Ms. Nga (Interpreter)   |
| <b>Contents: Breakout Session of Hydropower Group</b>  |  |
| Discussion Contents :  |  |
| 1. Breakout Session A-1  |  |
| CRA explained revised draft Technical Regulation on Hydropower Civil Works under MOC scope and JICA Hydro Team explained the outline of Guideline for Technical Regulation.  |  |
| CRA explained the outline of activities as follows:  |  |
| <ul style="list-style-type: none"> <li>✓ MARD executed the updating of TCXDVN-285/2002 and newly developed QCVN-04-05/2012 which was promulgated by MARD in June 2012 under the requirement of Standard Law in 2007.</li> <li>✓ Draft QCVN for Hydropower civil works is being newly prepared under MOC referring to the QCVN 04-05/2012 on hydraulic works developed by MARD and other relevant regulations and standards applying new approach with a manner different from that of QCVN 04-05.</li> </ul> |  |
| Vietnamese participants stated following comments.   |  |
| a) Technical Regulation  |  |
| ➤ (VN COLD Mr. Hong who is former MARD officer in charge of technical standards and regulations) Regarding hydraulic works, TCVN-5060/1990, TCXDVN-285/2002 and QCVN 04-05/2012 have been developed so far step by step and the role of technical  |  |

standards and regulations are significant.

According to the Standard Law 2007, difference between the standards (TCVN) and the regulation (QCVN), which stipulates mandatory requirements regarding safety, national security and environmental safety, has become clear.

It is required to develop QCVNs which are easy to understand.

The reason why I once objected to the contents of draft QCVN 04-05 is classification of the hydropower projects which is different from that of MARD. Now, the classification of hydropower project shall follow the criteria of MOIT as it was already applied.

- (VN COLD Mr. Hong) There is no difference between regulation for hydraulic works and hydropower works. So, the contents which are stipulated in QCVN 04-05 is not necessary to be reiterated in the Technical Regulation on Hydropower Civil Works.
- (CRA Dr. Vinh) Current structure and contents of the Technical Regulations have already reflected the result of previous discussions that too many contents referred to QCVN 04-05.
- (VN COLD Mr. Hong) The title of the Technical Regulation “National Technical Regulation on Hydropower Civil Works (Vietnamese title is “National Technical Regulation - Power Plants on Construction”)” does not coincide to the actual contents. It shall be changed, because the most of contents are not about construction works but about design.
- (VN COLD Mr. Hong) Some contents which are not applicable to mandatory regulations and are to be stipulated in technical standards (TCVN) shall be deleted or moved to the Guidelines. The contents in the mandatory regulations shall be only minimum requirements to keep the facility safe.  
For example, is it possible to limit the settlement within 1.0% of dam height? A dam which satisfies required functions could be already acceptable.  
Also, stipulations regarding gates include the contents to be stipulated in the technical standards (TCVN).
- (VN COLD Mr. Hong) The factor regarding protection measures against flood in downstream area shall be added as a criterion for selecting the class of hydropower works.
- The content is included by way of referring to Article 5.2 in QCVN 04-05 (CRA).
- (VN COLD Mr. Hong) It is not understandable why the formulating organization of the Technical Regulations is MOC, and why classification of hydropower civil structures by their installed capacity is not done by MOIT but by MOC  
It is required to review and revise the draft QCVN particularly for the contents regarding safety and flood.
- (Institute for hydropower and renewable energy:?) Conducting experiments is required in the QCVN 04-05, but the actual methods are not clear. The methods to conduct physical

experiments and mathematical analyses under various conditions shall be added as the supplemental explanation of QCVN 04-05.

- (CRA) Supplemental explanations are not necessary on QCVN 04-05. If users read the regulations thoroughly, they can find the contents are enough to conduct the works.
- (?) The content which is stipulated regarding warning to downstream area for discharging is needed to be added in Guideline.
- (JICA Team) The content is stipulated in the Technical Regulation Vol.4 formulated by MOIT.
- (?) It is recommended to add the contents regarding the measures against flood and safety in the downstream area.
- (CRA) Please refer to Article 7.15 and 7.16 of draft QCVN for hydropower civil works.
- (VN COLD Mr. Hong:?) Hydropower work is a part of hydraulic work. Therefore, the contents of new QCVN on Hydropower Civil Works shall be only additional ones without reiterating the contents of QCVN 04-05/2012.
- (VN COLD Mr. Hong:?) As the number of hydropower development will decline in the near future, necessity of the new QCVN on Hydropower Civil Works is not so high
- (VN COLD Mr. Hong:?) Although detailed provisions are provided in the draft QCVN regarding hydromechanical works, the provisions regarding maintenance works of hydromechanical equipment are insufficient and shall be added to Guidelines.
- (VN COLD Mr. Hong:?) Ambiguous words such as “if” are used in some contents, but such words are not recommended to be used in the mandatory regulations. The descriptions shall be paraphrased to suitable ones.
- (CRA) Some part of the contents in the Technical Regulations shall be selected as a suitable case for each project. In such cases, using “if” is necessary.  
(EVN Mr. Tien) In addition, some cases of using “if” in Vietnamese version are due to incorrect translation. So, they will be solved during the final review of translating to be done for the purpose of promulgation.
- (VN COLD Mr. Hong:?) The contents of draft QCVN shall be reviewed and separated into mandatory parts to be stipulated in QCVN and voluntary parts to be stipulated in standards. It is recommended to move the latter parts to Guideline.
- (VN COLD Mr. Hong:?) It is stipulated in the draft QCVN that 90 percent frequency flow of dry season shall be discharged to downstream of the river for environmental preservation (Article 7.1.3). But some current hydropower plants have other obligations and cannot adopt such a regulation. The stipulation shall be amended.
- (CRA) The Technical Regulations will be adopted to new projects constructed after promulgation, and will not be adapted to the existing power plants. The contents have been

formulated taking into consideration many practices of current power plants, so the content of the stipulation does not have major problems. As the discharge for environmental preservation is important, priority shall be given to discharging 90% frequency flow to downstream and viability of project shall be judged by the owner.

- (EVN Mr. Ngoc) It is recommended to follow Environmental Law regarding the discharge for environmental preservation stipulated in Article 7.1.3 of draft QCVN.
  - (Tuyen Quang HPP Mr.Tien) The extent which is necessary to take measures against flood is not clear (Article 7.1.13). It shall be confirmed whether the extent is from dam to sea or to the point confluent to the main river. It is recommended to refer the provisions of Decree No.72/2007/ND-CP “Management of Dam Safety (Articles 18 and 22)”, although there is no definition regarding the extent of downstream area.
- (JICA Team) It is not required to take measures against flood for downstream river course until river in Japan.
- (CRA) It depends on the scale of the project in Vietnam.
- (CRA) Proper stipulation will be proposed in the new QCVN.
- (CRA) It is difficult to answer to the question of downstream extent of flood prevention measures for the present. The extent shall be approved by a competent agency of state level or provincial level or a lower level depending on project scale.
- (?) Articles regarding tests and experiments besides dams and reservoirs shall be added to Technical Regulations.

#### b) Guidelines

- (?) The stipulations in the Guidelines shall be specific enough to understand how to design or work for users. In addition, Vietnamese conditions shall be taken into consideration.
- (JICA Team) JICA team will apply the request to a maximum extent, but it is difficult because the conditions of each project varies widely.

#### 2. Breakout Session A-2

JICA Hydro Team explained the outline of 2<sup>nd</sup> draft of Guidelines for Technical Regulation Vol.4.

There were not any questions and comments regarding vol. 4 of the Guidelines.

#### 3. Breakout Session A-3

JICA Hydro Team explained the outline of 2<sup>nd</sup> draft of Guidelines for Technical Regulation Vol.5.

Vietnamese participants stated following comments.



- (EVN Mr. Tien) Regarding Article 79 “Insulation resistance measurement”, difference between the following two formulae to calculate polarization index, P.I;
- 1)  $P.I = R_{10} / R_1$
- Where,
- R10: insulation resistance value measured at 10 minutes
- R1: insulation resistance value measured at one minute
- 2)  $P.I = R_{60} / R_{15}$
- Where,
- R60 : insulation resistance value measured at 60 seconds
- R15: insulation resistance value measured at 15 seconds
- It is necessary to provide which formula shall be adopted.
- (JICA Team) This article proposes the formula of 1) and JICA Project Team will explain the difference between the above two formulae later.
- (Tuyen Quang HPP) It is desirable that detailed test methods, classification patterns and judgment criteria are added to articles of Guidelines.
- Guidelines are not operation and maintenance manuals, and not so many items can be added to them. However, JICA Project Team will confirm comments and reply to them.
- (Tuyen Quang HPP) It is desirable that Technical Regulations should be suited to the present situation of electrical equipment in Vietnam because regulations in other developed countries cannot always be adapted to electrical equipment in Vietnam.
- The JICA Project Team has researched staff’s ideas in hydropower plants to adapt them to Technical Regulations and Guidelines by site investigations and baseline survey, though the team could not collect the whole data on the number and specifications of test devices.

MOIT and JICA Project team will accept other questions and comments by e-mail. The limit date for submitting comments is 30 November 2012.

Concluded

## **Appendix-5.2**

### **Minutes of Workshop (Thermal Power Group)**

|    |   |             |
|----|---|-------------|
| 1. | Minutes of 1 <sup>st</sup> WS in HCMC     | 11/Mar/2011 |
| 2. | Minutes of 1 <sup>st</sup> WS in HANOI    | 15/Mar/2011 |
| 3. | Minutes of 2 <sup>nd</sup> WS in HCMC     | 22/Jun/2011 |
| 4. | Minutes of 2 <sup>nd</sup> WS in Nha Tran | 24/Jun/2011 |
| 5. | Minutes of 2 <sup>nd</sup> WS in HANOI    | 28/Jun/2011 |
| 6. | Minutes of 3 <sup>rd</sup> WS in HCMC     | 26/Oct/2012 |
| 7. | Minutes of 3 <sup>rd</sup> WS in HANOI    | 30/Oct/2012 |

# **1. WORKSHOP REPORT ON THERMAL GROUP IN HO CHI MINH (11/Mar/2011)**

## **I. GERNERAL WORKSHOP SESSION:**

### **1.1. Chair a meeting:**

- (1) Mr. Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Tran Huu Ha – Deputy Department – Department of Science and Technology – Ministry of Construction

### **1.2. Participation:**

- Participation:

- (1) Experts - Department of Science and Technology – Ministry of Industry and Trade
- (2) Experts - Department of Science and Technology – Ministry of Construction
- (3) Experts of JICA project Team – Japan
- (4) Experts of Electric Viet Nam– EVN;
- (5) Sub-consultant group - ETC1
- (6) Guests - represent the units - the invited list was agreed by JMC

### **1.3. Time:**

Begin: 8: 40 AM, March 11, 2011 at Caravel Hotel–Ho Chi Minh City

### **1.4. The comments in the workshop session:**

Not mentioned in the report of the group.

## **II. WORKSHOP SESSION OF THERMAL GROUP:**

### **2.1. Chair a meeting:**

- (1) Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Nguyen Quoc Viet: Deputy Head of Science, Technology & Environment – EVN
- (3) Thermal expert group of WEST JEC – Japan

### **2.2. Participation:**

- (1) Sub-consultant group - ETC1
- (2) Guests of thermal group, representing the units as listed in the table below

| No | Name              | Working position                               | Unit                              | Phone       |
|----|-------------------|--|-----------------------------------|-------------|
| 1  | Le Que Thua       | Foreman I&C                                    | Phu My 2 Thermal Power Plant      | 0962501434  |
| 2  | Le Kim Ba         | Operation manager                              | Ca Mau Thermal Power Plant        | 0918117969  |
| 3  | Phan Van Dung     | Deputy general manager                         | Ba Ria Thermal Power Plant        | 0962501005  |
| 4  | Do Thanh Lai      | Design Engineering                             | PECC 4                            | 0909181535  |
| 5  | Ho Ngoc Tuong     | Expert   | Southern Electric Testing Company | 0973102558  |
| 6  | Vo Vi Na          | Chargeman I&C                                  | PhuMy Thermal Power Plant         | 0903031800  |
| 7  | Le Thanh Thuan    | Expert   | Hiep Phuoc Thermal Power Plant    | 0938410583  |
| 8  | Nguyen Tien Duc   | Engineering                                    | Southern Electric Testing Company | 0913735078  |
| 9  | Đo Huu Thuy       | Engineering                                    | Mekong Energy Company             | 0903350898  |
| 10 | Vo Hoang Anh Tuan | Expert –Materials, Plan Department             | Thu Duc Thermal Power Plant       | 01283688889 |
| 11 | Nguyen Duy Lang   | Chief of department- Technical Plan Department | Can Tho Thermal Power Plant       | 0963136146  |
| 12 | Đoan Cong Duc     | Deputy General Manager                         | Nhon Trach 1 Thermal Power Plant  | 0983730305  |
| 13 | Le Bao Toan       | Technical staff                                | Southern Electric Testing Company | 0989953245  |
| 14 | Nguyen Hoang Thi  | Expert –Technical Plan Department              | PECC 2                            | 0908139149  |
| 15 | Vo Thanh Truong   | Engineering                                    | Hiệp Phuoc Thermal Power Plant    | 0905641060  |
| 16 | Tran Huu Tien     | Engineering                                    | Phu My 1 Thermal Power Plant      | 0962501775  |
| 17 | Tran Duc Tue      | Engineering                                    | Dung Quat Oil Refinery Plant      | 0983470476  |
| 18 | Tran Van Luong    | Deputy General Manager                         | PVEIC                             | 0918880789  |
| 19 | Nguyen Hong Minh  | Engineering                                    | PVEIC                             | 0935000004  |

**2.3. Time:** begin 10:40 AM

**2.4. The comments in the workshop session:**

**2.4.1: The comments of MOIT and EVN:**

- (1) Recommend participants only discussed the major issues, approach policy how does establish way the technical regulation and guideline to accommodate? (Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade)
  - This is comment of the participants at the workshop, JICA did not answer. (JICA)
- (2) Recommend plants under EVN frank comments on draft 2 of 3 QCVN-5, QCVN-6 and QCVN

on new thermal power plant design, with qualify as influenced by 3 QCVN and guidelines in the stage 2 of the project. (Mr. Nguyen Quoc Viet: Deputy Head of Science, Technology & Environment – EVN)

- This is comment of the participants at the workshop, JICA did not answer.(JICA)
- (3) What does base on to amendment QCVN?
- Based on the regulations and standards of Vietnam, is amended by reference to the regulations and standards of Japan.
- (4) Parts in Vol5, Vol6 have “General provisions” article, this article is not necessary. Comment: Should only have "General provisions" are placed at the beginning?
- We will acquire this comment.(JICA)
- (5) All questions of JICA consultants when go to plants in Vietnam, JICA consultants have done editing? If not, why?
- We acquire, discuss and amend proper comments but do not alter the basic structure of the regulations.

#### **2.4.2: The comments of participations:**

- (1) To explain and clarify Mr. Long’s comment about the research process offer draft 2 of 3 QCVN and guideline in the stage 2 of the project.( Mr. Trinh Van Yen: Chief of Thermal group – ETC1)
- (2) QCVN amended can be applied to all the thermal power plants or each thermal power plant. Are QCVN compliant with power plants having other possession forms such as IPP, BOT...?( Mr. Le Kim Ba: Operation manager, Ca Mau Thermal Power Plant under EPVN)
- The QCVN is composed to be applied to the thermal power plants; there are different forms of ownership.
- (3) Is QCVN amended to replace the old regulations?( Mr. Doan Cong Duc: Deputy General Manager Nhon Trach 1 Thermal Power Plant under EPVN)
- (4) Is QCVN amended to replace the old regulations?
- Yes, it is. (JICA)
- (5) Draft in Vol5, Vol6 and QCVN on new thermal power plant design mentioned to fields gas turbine and combined cycle still sketchy, Wind power is not mentioned.
- In the scope of this project, we only mention the fired type thermal power plants, and gas turbine, combined cycle; even wind power is beyond the work scope of the project. (JICA)

#### **2.4.3: The comments of participations were referenced by ETC1:**

- (1) Agree with the second draft and approach when establish QCVN and guideline of the project team. (Mr. Phan Van Dung: Deputy General Manager Ba Ria Thermal Power Plant EVN)
- (2) QCVN for new thermal power plant design not be applied to the old thermal power plant because new QCVN demanding high request, old Plants can not invest to response.
- (3) Agree with the second draft and approach when establish QCVN and guideline of the project

team.( Mr. Nguyen Duy Lang: Chief of department- Technical Plan Department- Can Tho Thermal Power Plant- Omon – EVN)

**THERMAL GROUP– ETC1**

**Trinh Van Yen**

## **2. WORKSHOP REPORT ON THERMAL GROUP IN HA NOI (15/Mar/2011)**

### **I. GERNERAL WORKSHOP SESSION:**

#### **1.1. Chair a meeting:**

- (1) Mr. Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade

#### **1.2. Participation:**

- Participation:

- (1) Experts - Department of Science and Technology – Ministry of Industry and Trade
- (2) Experts - Department of Science and Technology – Ministry of Construction
- (3) Experts of JICA project Team – Japan
- (4) Experts of Electric Viet Nam– EVN
- (5) Sub-consultant group - ETC1
- (6) Guests - represent the units - the invited list was agreed by JMC

#### **1.3. Time:**

Begin: 8: 40 AM, March 15, 2011 at Melia Hotel–Hanoi Capital

#### **1.4. The comments in the workshop session:**

Not mentioned in the report of the group.

### **II. WORKSHOP SESSION OF THERMAL GROUP:**

#### **2.1. Chair a meeting:**

- (1) Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Vu Ta Thong: Expert – Department of Technology – EVN
- (3) Thermal expert group of WEST JEC – Japan

#### **2.2. Participation:**

- (1) Sub-consultant group - ETC1
- (2) Guests of thermal group, representing the units as listed in the table below

| No | Name              | Working position                         | Unit  | Phone      | e-mail                    |
|----|-------------------|--|---|------------|---------------------------|
| 1  | Le Anh Duc        | Engineering                              | PECC 1  | 0912188546 | LeanhDucP21@gmail.com     |
| 2  | Do Duc Tong       | Expert                                   | Quangnam Thermal Power Plant                              | 0915419245 | Ductong101186@gmail.com   |
| 3  | Vu Xuan Cuong     | Deputy Director                          | Phalai Thermal Power Plant                                | 0913599729 |                           |
| 4  | Dao Minh Hoa      | Expert                                   | PECC 1  | 0917399887 | Hoadm.pecc1@gmail.com     |
| 5  | Nguyen Xuan Bac   | Electric-Relay Manager                   | Habac Nitrogenous Fertilizer and Chemical Company Limited | 0915066392 |                           |
| 6  | Nguyen Minh Tuan  | Expert                                   | Caongan Thermal Power Plant                               | 0983531883 | Minhtuancnpc@gmail.com    |
| 7  | Truong Duy Nghia  | President                                | Vietnam Thermal Technical Association                     | 0903431753 | hoinhietvietnam@yahoo.com |
| 8  | Ngo Quy Tho       | Technical Staff                          | Habac Nitrogenous Fertilizer and Chemical Company Limited | 0985213699 | Ngoquytho23@gmail.com     |
| 9  | Phung Van Cuong   | Deputy Director                          | Consultant Centre - Institute of Energy                   | 0983297489 | Cuongpv74@gmail.com       |
| 10 | Pham Xuan Phong   | Deputy Director                          | Naduong Thermal Power Plant                               | 0912066549 | phongndnd@gmail.com       |
| 11 | Nguyen Ngoc Thang | Deputy Manager of Safety -Technical Room | Ninhbinh Thermal Power Plant                              | 0912481313 | thangnbinh@yahoo.com.vn   |
| 12 | Phan Van Hoi      | Technical Staff                          | Ninhbinh Thermal Power Plant                              | 0912938693 | Hoipvtca@yahoo.com.vn     |
| 13 | Pham Xuan Khoat   | Safety -Technical Staff                  | Uongbi Thermal Power Plant                                | 0917369686 |                           |
| 14 | Tran Van Son      | Safety -Technical Staff                  | Uongbi Thermal Power Plant                                | 0985887556 |                           |
| 15 | Ta Dinh Binh      | Expert                                   | Technical committee -PVP                                  | 0904383056 | tadinhbinh@PV-Power.vn    |

**2.3. Time:** begin 10:40 AM



## **2.4. The comments in the workshop session:**

### **2.4.1: The comments of MOIT and EVN:**

- (1) Recommend participants only discussed the major issues, approach policy how does establish way the technical regulation and guideline to accommodate. (Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade)
- (2) Recommend JICA and participants discuss, consider whether take the provisions on transporting and storing fuel LPG, NPG into new draft QCVN (design) or not ? Because Vietnam does not have the power plants that use these fuels.
  - We will further discuss the issue of transporting, storing fuel LPG, NPG during the upcoming working group. (JICA)
- (3) There is provision mentioned boiler periodic inspection in 6 years is too long, cannot guarantee the quality of equipment? (Mr. Vu Ta Thong: Expert – Department of Technology - EVN)
  - This is only suggested, not the official provision of the standard. Provisions in Japan, boiler inspection cycle are two years (this can be a big difference in comparison with Vietnam). The draft regulations proposed boiler inspection cycle for maximum is 6 years. But the plants depending on their equipment conditions which can build inspection cycles from 2 to 3 years, as long as does not exceed six years prescribed by regulation. In Vietnam the new plants are being built so much should periodic inspection cycles between old and new plants will be different. Therefore, each plant can decide periodic inspection cycle independently. (JICA)
- (4) How articles in Vol5, Vol6 on overhaul and maintenance of equipment according to level ability of the Plants stipulate? Do not understand? Request to explain more clearly.
  - This can be understood as follows: The plant according to their capacity can carry out the overhaul, maintenance or hire other companies. If plant hires an outside factory which specialized maintenance services, then an incident occurs, the ultimate responsibility still belongs to the plant. (JICA)
- (5) The protective equipment, measurement and control of thermal power plants must be stipulated in the technical regulation QCVN?
  - Within the work scope of this project, the provisions relating to control devices not included in the draft QCVN. However, the provisions on the principle of protection to prevent incidents and hazards are specified in the new draft QCVN (design). (JICA)

### **2.4.2: The comments of participations:**

#### **• Comments in session B1:**

- (1) To establish QCVN, there must be having relatively complete technical standards. In Vietnam, the standards needed for power plants is still lacking, so request the consultants JICA help MOIT to establish Vietnam standards TCVN ago, after that establish regulations QCVN Vietnam. (Mr. Truong Duy Nghia: President of Vietnam Thermal Technical Association)

- In the first stage: build QCVN; Stage 2: build guideline (especially standards). Guideline is voluntary, just as the instructions and will have explanations and examples to make it clear that the QCVN show. MOIT helping build the Vietnam standard TCVN as his proposal is not in the scope of the project. (JICA)
- (2) The number of standards needed for power plant about 600 standards, after the establish QCVN then guideline (JICA called the special standard) to guide QCVN will be very huge. Request JICA further explain how the establishing can be such a large number of Guideline?
  - No Answer.
- (3) According to Vietnam's provision, standards of countries as Japan, America, Britain, France, and Germany are accepted directly applicable in Vietnam. Standards of other countries as China, Malaysia ... they must be re-evaluated before being allowed to apply. Are QCVN harmonious and in accordance with the standards of Japan's electricity and international standards?
  - JICA answer: In the draft QCVN will stipulated: can refer to standards such as ASME, JIF, DIN, ISO, but not mandatory to follow any standards.
- (4) When establish the Vietnam regulations, does JICA have reference Vietnam standards and other relevant provisions of Vietnam (fire, environment ...)?
  - In the process of implementing Stage 1 of the project, Working Groups and JICA referenced standards and related regulations. (Mr. Long)

• **Comments in session B2:**

- (1) When establish the Vietnam regulations; does JICA have reference to the old regulations of the Vietnam? (Mr. Truong Duy Nghia: President of Vietnam Thermal Technical Association)
  - Yes. (JICA)
- (2) Which QCVN was established according to technical regulations of the country?
  - Japan. (JICA)
- (3) The QCVN was established is based on technical standards, so when establish QCVN, does JICA have a new reference standards related to fuel LPG, NPG and standards for boilers are critical parameters , supercritical ?
  - Sample technical standards of advanced countries (Japan, U.S. and Western Europe ...), all have in common is: given the requirements for the parties involved do safely things, not do any safety things. (JICA)
- (4) Please see the working prototype technical standards of Japan.
  - Participants can be found them on internet, but only have the Japanese version, not have English version. (Mr. Long)

• **Comments in session B3:**

- (1) Before publish QCVN establishing, request working group take full of comments before July 2011, in order when release QCVN, they will have high performance value. (Mr. Truong Duy

Nghia: President of Vietnam Thermal Technical Association)

- Through two workshops was held in May 7 / 2011 here, and get comments, JICA will resubmit the draft QCVN for MOIT. Then, to issue this QCVN, MOIT will implement follow the order of the current provisions. (JICA)
- (2) The contributed comments for establish QCVN should be sent directly to the editor.
    - Name and address of the mailbox, the time to receive comments on the screen of workshop. Recommend participants send comments to the correct address and time limit. (Mr. Long)
  - (3) Recommend before organize workshop in July, 2011, should submit earlier documents to the participant's studies.
    - MOIT will be responsible for sending the draft QCVN for the participants before the workshop. (Mr. Long)
  - (4) QCVN for design new thermal power plant only applies to new power plants is not satisfactory. Should contain provisions on the term to apply to the old power plants?
    - In some specific cases, such as environmental, can stipulate applied mandatory time limit for old power plants. For new power plant projects were approved before the new QCVN were issued, not mandatory implementation. (JICA)

#### **2.4.3: The comments of participations were referenced by ETC1:**

- (1) Representatives of the Uong Bi thermal power plant: establishing QCVN approach only stipulates the minimum requirements for power plants to ensure safe, stable power supply and environmental protection is compliant with the thermal power plants.
- (2) Representatives of other power plants: When establish the guideline, as well as detailed instructions. Like that the new QCVN be applied easily.

**THERMAL GROUP– ETC1**  
**Trinh Van Yen**

### **3. WORKSHOP REPORT ON THERMAL GROUP IN HO CHI MINH (22/Jun/2011)**

#### **I. GERNERAL WORKSHOP SESSION:**

##### **1.1. Chair a meeting:**

- (1) Mr. Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Tran Hong Tien – Expert – Department of production Technology – EVN
- (3) Mr. Nakamura – Leader of JICA project – Japan

##### **1.2. Participation:**

- Participation:

- (1) Experts - Department of Science and Technology – Ministry of Industry and Trade
- (2) Experts of JICA project Team – Japan
- (3) Experts of Electric Viet Nam Group – EVN
- (4) Sub-consultant group - ETC1
- (5) Guests - represent the units - the invited list was agreed by JMC

##### **1.3. Time:**

Begin: 8: 30 AM, June 22, 2011 at Caravel Hotel–Ho Chi Minh City

##### **1.4. The comments in the workshop session:**

Not mentioned in the report of the group.

#### **II. WORKSHOP SESSION OF THERMAL GROUP:**

##### **2.1. Chair a meeting:**

- (1) Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Vu Ta Thong: – Expert – Department of Production Technology – EVN
- (3) Thermal expert group of WEST JEC – Japan

##### **2.2. Participation:**

- (1) Sub-consultant group - ETC1
- (2) Guests of thermal group, representing the units as listed in the table below

| No | Name             | Working position                               | Unit                              | Phone      | Mail                    |
|----|------------------|--|-----------------------------------|------------|-------------------------|
| 1  | Pham Hong Tien   | Leader of operation department                 | Hiep phuoc Thermal power          | 0903717766 |                         |
| 2  | Tran Huu Tri     | Deputy of operation department                 | Hiep phuoc Thermal power          | 0908861598 | huutri@hiep-phuoc.com   |
| 3  | Phan Van Dung    | Deputy general manager                         | Ba ria Thermal power              | 0962501005 |                         |
| 4  | Nguyen Thuy Ha   | Deputy of department                           | PECC 2                            | 0903937979 | Ha.nt@pecc2.com         |
| 5  | Nguyen Hai Bang  | Engineer                                       | PECC 2                            | 0904300916 | Bang.nh@pecc2.com       |
| 6  | Tran Đình An     | Technical staff                                | Phu My Thermal power              | 0962501432 | antd@pmypv.evn.vn       |
| 7  | Le Hoang Thu     | Staff  | Phu My Thermal power              | 0962501061 | thulh@pmypv.evn.vn      |
| 8  | Le Quy Thua      | Staff  | Phu My Thermal power              | 0962501434 | thualq@pmypv.evn.vn     |
| 9  | Vo Vi Na         | Staff  | Phu My Thermal power              | 0903031800 | navv@pmypv.evn.vn       |
| 10 | Vo Anh Tuan      | Assistant of manager                           | Nhon Trach Thermal power          | 0909560440 | tuanpvpnt@yahoo.com.vn  |
| 11 | Đào Van Ha       | Expert of Technical Department                 | Nhon Trach Thermal power          | 0907487836 | daovanha@PV-Power-nt.vn |
| 12 | Nguyen Duy Lang  | Leader of department-Technical Plan Department | Can tho Thermal power             | 0963136146 | Langnd.omon@gmail.com   |
| 13 | Bui Van Thang    | Deputy of department-Technical Plan Department | Can tho Thermal power             | 0909445586 | Thangbv.omon@gmail.com  |
| 14 | Đo Thanh Tuyen   | Deputy of manager                              | Thu duc Thermal power             | 0963555988 | Hailua8888@gmail.com    |
| 15 | Phan Nam Thanh   | Technical staff                                | Southern Electric Testing Company | 0972949359 | thanhpn@etc2.vn         |
| 16 | Tran Cong Nguyen | Deputy of technical department                 | Ca mau thermal power              | 0914392989 | Nguyentc.pm4@gmail.com  |
| 17 | Vo Tan Thanh     | Technical staff                                | Ca mau thermal power              | 0984372537 | Thanhvn20@gmail.com     |
| 18 | Le Bao Đức       | Technical staff                                | Ca mau thermal power              | 0918087802 | lebaoduc@gmail.com      |
| 19 | Ho Van Nghia     | Technical staff                                | Formosa thermal power             | 0903882770 |                         |

**2.3. Time:** begin 10:20 AM

**2.4. The comments in the workshop session:**

**A. The comments in break out of B1:**

**1. Mr. Vu Ta Thong:** Expert – Department of Technology - EVN:

- (1) The question: Please explain the English phrase: "Administration manual". Conditions for the safe and stable operation of thermal power plant which is operation workers must know and understand: "Handbook of administration and operating the thermal power plant," so how many books?
  - In thermal power plants having one or more books: "Handbook of administration and operating the thermal power plant" is not important, just enough. (Mr. Long)

**2. Mr. Nguyen Van Long:** Expert - Department of Science and Technology – Ministry of Industry and Trade:

- (1) The first comment: Explaining why removes some of articles from Volume to other Volume, split the Regulation and Guideline how to facilitate.
- (2) The second comment: The control system changes frequently according to time - new technical advances, JICA Consultant recommended additional research on this matter.
  - Will answer to Mr. Long's comments by written after. (JICA)

**3. Mr. Phan Van Dung:** Deputy General Manager Ba Ria Thermal Power Plant – EVN:

- (1) Why the provision of the plant control system is not mentioned in the regulations? This part is a very important for the stable and safe operation of plants?
  - Some of parts mention the control system in addition it is difficult to make detailed provisions on the control system. This is the reason, control systems are complex, diverse and technical progress is rapid development. Regulations only make the minimum technical requirements, the not important part will not be input, and Guideline will provide guidance and specific examples to understand (JICA)
- (2) Should be considering, make control system on regulations to raise the importance?
  - Technical regulations give only the most basic, control system should take into Guideline, should not be take into compulsory. (JICA)

**4. Mr. Vo Anh Tuan** – Assistant of manager – Nhon Trach thermal power plant:

- (1) Phrase: "Measurement and Protection devices" should replace by "Measurement, control and protection devices". In the "Technical regulation on design of thermal Power Facilities" Part 9: "Measurement and Protection Equipment" has three parts: 1. Measuring Equipment, 2. Protection Equipment, 3. SCADA/EMS system. Should be added Part 4: control system.
  - This content is not necessary to here, in the technical design standards: "Article 12 Chapter 4 the principles of safety" was mentioned. (JICA)

**5. Mr. Nguyen Hai Bang: PECC 2 – EVN:**

- (1) The first comment: Content in "Process of management thermal power plant", some of parts are cumbersome; some of parts are not so included. For example, the security organization chart; function, responsibilities, authority and organize meetings. This title should remove to the reference document.
  - Content in "Process of management thermal power plant" provided by the designer. (Mr. Long)
- (2) Article 220 Chapter 2. Devices to prevent air pollution. How does NO<sub>x</sub> (according to NO<sub>2</sub>) calculate? Can the experts of JICA consultant explain?
  - Will answer to Mr. Bang's comments by written after. (JICA)

**A. The comments in break out of B2:**

**1. Mr. Vu Ta Thong: Expert – Department of Technology - EVN:**

- (1) The first comment: Please explain section 60 - T1- answer portion of JICA's comment, it is relation to Article 162, Part of the steam turbine in Volume 5?
- (2) The Article 141 "Interlock test" should be add in to section (4): "Auxiliaries-related interlock test" contents: "Automatic start of turbine control system oil pump" and "high pressure feed water heater".
  - There will consult together in Working Group session. (JICA)

**2. Tran Dinh An – Technical staff – Phu my thermal power plant –EVN:**

- (1) The first comment: Translation English version to Vietnamese version is the mistake in Volume 5.
  - Responsibility in Vietnamese version is from MOIT. JICA have only the responsibility in English version. (JICA)
  - Before issue, QCVN have to take many steps: revise evaluation etc so the error in the Vietnamese version will be overcome. (Mr. Long)
- (2) Article 145 in Volume 5 Load testing, the changes remove to the Guideline only regulate for steam turbine, so gas turbine no have.
- (3) Article 160 in Volume 5 is stipulating for many of boiler type, however the heat recovery boiler is not enough, should be added.
  - JICA consultant is not answered Mr. An's comments No 2 and 3, yet.

**3. Mr. Nguyen Hai Bang: PECC 2 – EVN:**

- (1) Vol5 general comments: As for the "Purpose" and "General requirements" shall be not change," the detail steps should be taken into Guideline.

- Will answer to Mr. Bang's comments by written after. (JICA)

#### **A. The comments in break out of B3:**

##### **1. Mr. Do Thanh Tuyen – Deputy director – Thu đuc Thermal power plant – EVN**

- (1) Article 141 “Check of protection equipment before starting up boilers” In some cases boiler standby over 72 hours standby no need to check before restart.
  - JICA consultant should research added this article because it relates to safe regulation and standard. (JICA)
- (2) Article 158: Should stipulate added how the temperature and pressure level to discharge? Why the regulation stipulate to be 80°C that is just to discharge?
  - This is the original of old regulation, Mr. Long will be answering. (JICA)
  - Old regulations are not appropriate, JICA consultant should research added to make the new regulation. (Mr. Long)
- (3) Article 161 No needs to stop the boiler in case the remote water level indicators are broken?
  - Article 161 provisions on normal shutdown, emergency shutdown is not. When the remote water level indicators are broken, the boiler have still water level meter in site, but very difficult to operate the boiler. So this article should be consideration that it relates to safety. (Mr. Yên –ETC1)
- (4) Article 231 Flow measuring is not necessary for continuer discharge?
  - JICA consultant is not answered, yet.
  - In some of the boilers, continuer discharge already has flow-meter. However, most of the old boilers are not equipped with flow-meters. The problem is that the new regulations are mandatory to apply for the old boilers or not? (Mr. Yên –ETC1)
  - Should not be mandatory with old boilers which have to equip flow meter because of expensive and not be economic. (Mr. Dung – Deputy General Manager Ba Ria Thermal Power Plant)
  - This problem need to research added by 2 consultant companies(Mr. Long)

##### **2. Mr. Vo Vi Na - Phu My thermal power plant –EVN:**

- (1) Article 280: “Close electric of impulse” If first time Transformer already connection by energizing full impulse voltage, but after overhaul the weddings of transformer after that shall be energizing full impulse voltage again or no?
- (2) Article 278 “Close electric of transformer” Normally, the pressure and gas relay are activated after that must be testing before to re-operate. According to EVN provisions: if pressure relay, gas relay and 87 relay are activated after that must be testing before to re-operate again or not?



➤ JICA consultant is not answered, yet

### **2.4.3: The comments of participations were referenced by ETC1:**

1. Opinions of Phu My thermal power plant about "Technical regulation on design of thermal Power Facilities":
  - (1) Article 253 Table 28 "Protection device of the main transformer" that should replace by "Protection device for gas turbine"
  - (2) Article 249 Table 25 "Measurement device of main transformer" should be added content: "Measure the temperature of the transformer windings"
  - (3) Article 247 Table 23, the addition of the "Temperature measurement of combustion air into gas turbine" or " Temperature of flue gas"
  - (4) Article 7: For Classification of Electric Voltage is according to provision of Vietnam, proposed changes to suit with Vietnam

Voltage low: < 1000 V

Voltage middle: from 1 to 35 kV

Voltage high: from 35 to 220 kV

Voltage high super: > 220 kV

**THERMAL POWER GROUP – ETC1**

**Trinh Van Yen**

## **4. WORKSHOP REPORT ON THERMAL GROUP IN NHATRANG (24/Jun/2011)**

### **I. GERNERAL WORKSHOP SESSION:**

#### **1.1. Chair a meeting:**

- (1) Mr. Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Tran Hong Tien – Expert - Production Technology Department- EVN
- (3) Mr. Nakamura – Leader of JICA Project Group – Japan

#### **1.2. Participation:**

- Participation:

- (1) Experts - Department of Science and Technology – Ministry of Industry and Trade
- (2) Experts of JICA project Team – Japan
- (3) Experts of Electric Viet Nam– EVN
- (4) Sub-consultant group - ETC1
- (5) Guests - represent the units - the invited list was agreed by JMC

#### **1.3. Time:**

Begin: 8: 30 AM, June 24, 2011 at Sunrise –Nhatrang City

#### **1.4. The comments in the workshop session:**

Not mentioned in the report of the group.

### **II. WORKSHOP SESSION OF THERMAL GROUP:**

#### **2.1. Chair a meeting:**

- (1) Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Vu Ta Thong: Expert – Department of Technology – EVN
- (3) Thermal expert group of WEST JEC – Japan

#### **2.2. Participation:**

- (1) Sub-consultant group - ETC1
- (2) Guests of thermal group, representing the units as listed in the table below

| No | Name             | Working position | Unit                         | Phone      | Mail                 |
|----|------------------|------------------|------------------------------|------------|----------------------|
| 1  | Bui Van Tien     | Director         | PECC 4                       | 0905241934 | buivantien@gmail.com |
| 2  | Nguyen Tu Duc    | Expert           | PECC 4                       |            |                      |
| 3  | Tran Khanh Trung | Expert           | PECC 4                       |            |                      |
| 4  | Nguyen Cuong     | Expert           | PECC 4                       |            |                      |
| 5  | Nguyen Quoc Huan | Expert           | PECC 4                       |            |                      |
| 6  | Lam Hoai Vuong   | Expert           | PECC 4                       |            |                      |
| 7  | Ly Dinh Huy      | Expert           | PECC 4                       |            |                      |
| 8  | Tran Duc Tue     | Expert           | Binh Son petrochemical plant | 0983470476 | tuetd@dqr.com.vn     |
| 9  | Nguyen Thanh Nam | Expert           | Binh Son petrochemical plant |            |                      |

**2.3. Time:** begin 10:20 AM

**2.4. The comments in the workshop session:**

**A. Comments in session B1:**

**1. Mr. Nguyen Van Long:** Expert - Department of Science and Technology – Ministry of Industry and Trade

- (1) Explain more clearly about the related legal systems and the role of QCVN and guideline.
- (2) Explain more clearly about the process of establish QCVN.

**2. Mr. Bui Van Tien:** Director - PECC 4 - EVN:

- (1) After read draft QCVN on thermal power facilities design
  - 1) Languages poor and incorrect translation
  - 2) The Table of content should be a unified language, also for the wrong.
  - 3) Page 32 Low-pressure pipelines underground motor ways: Item 3, Article 75 should change "security" to "safety" Item 5, 6 and 7 of Article 75: explain the value of 1.5 m; "not be greater" should be replaced by "not be smaller"
    - Value 1,5m based on Japan standard, we agree revise: "not be greater" should be replaced by "not be smaller". (JICA)
    - Vietnam Consultant (PECC 4) side: if you have specific documents, you can provide to reference. (Mr. Long)
    - Vietnam side should refer to documents of other countries to give more reasonable values. (Mr. Tien (PECC4))

- (2) Propose research above documents and refer to the standards of some other countries outside the standard of Japan. Since it will make the final decision.
  - At this time, we don't answer and will research to answer later. (JICA)
  - Propose you research this issue, better you should refer to data from standards of other countries. (Mr. Long)
- (3) Item 1 of Articles 75, not understand phrase "lack of load in the car", suggest revise.
  - Mean of phrase is minimum or not affect to. (JICA)

## **B. Comments in session B2:**

### **1. Mr. Nguyen Van Long:** Expert - Department of Science and Technology – Ministry of Industry and Trade

- (1) New provision on the national network from 110 kV or greater. Thus, for small plants which connect to network through power system have voltage level is 35 kV or smaller will not in the scope? Propose participants comment about applicable scope of QCVN vol.5.
- (2) Explain to describe more clearly between regulations, standards and Guideline. Propose participants comment about articles in QCVN vol.5.

### **2. Mr. Bui Van Tien:** Director - PECC 4 - EVN:

- (1) Article 2: Applicable scope: If power plants don't connect to national power system then do power plants have to apply to QCVN? Because purpose of QCVN is applicable for all power plants in Vietnam.
  - If power plants don't connect to national network then they are not applicable. In future, will have decrees to stipulate to them. May be in future, we will specific guide for each power plant types. And now, only apply to big power plants. However, we will discuss to MOIT and EVN about this issue at Working Group. (JICA)
  - Binh Son petrochemical plants separate to units and not connect to network, only use in local. Does plant ruled by provisions of QCVN? (Mr. Tien)
- (2) Slide 14, Article 148 of draft Guideline: measurement of grounding resistance: what kind of resistance value is mentioned in this? (Maximum or minimum?) Follow me, is it maximum?
  - This example means not excess maximum value of 3 columns: Dielectric Voltage, Step voltage, Touch voltage. (JICA)
  - English sentence is unclear; please edit the English version to more clearly. (Mr. Tien)

### **3. Mr. Tran Duc Tue – Expert – Binh Son petrochemical plant**

- (1) According to the draft of QCVN, power plants connect to network at level 22 kV will not in the scope of application. With provision National Network is power network has voltage level 110 kV or greater, the scope of this QCVN is too narrow?
  - This period cannot cover all types of Plants, so the problem QCVN stipulate for all types of plants will be for later. For Japan regulations, they covers all, but in Vietnam during this period due to lack of resources and other issues that have not done. (JICA)

### **4. Mr. Vu Ta Thong: Expert- Production Technology Department – EVN:**

- (1) Should consider classifying the scope of application by type of power plants: hydropower and thermal power, take output of power plants is criteria for classification of QCVN scope?
  - QCVN should stipulate scope of application for thermal power by capacity to ensure safety and stability operation for the different types of plants: either sells electricity or a self-sufficient for its own load. (Mr. Yên – ETC 1)
  - JICA answer: not answer

## **C. Comments in session B3:**

### **1. Mr. Bui Van Tien: Director - PECC 4 - EVN:**

- (1) Article 11 Page 3: should use the phrase "Council of acceptance" changes to the phrase "department of acceptance" in accordance with Vietnam's provisions on the acceptance of works.
  - Propose MOIT review to use any clauses for the appropriate phrase. (JICA)
- (2) Article 105 page-25 stipulate about transport fuel by rail; have not any provisions for transport by river and sea? Because in the future, the power plants in Vietnam will use this type of lot.
  - Transportation of fuel by river and sea are not under scope of power plants. In the framework of this project cannot check all the documents of the ministries and other sectors. When transportation by waterway, they must comply with relevant laws. This problem is not our responsibility. (JICA)
  - Propose expansion of administration scope of the transportation fuel in power plants into waterways. (Mr. Tien)
  - Should remove the provisions on transport fuel by rail. QCVN only those provisions within the Power Plant scope. (Mr. Long)
- (3) Article 144 regulate about water levels in the steam drum at starting state. For new technology: critical boiler and supercritical boiler (do not use steam drum) are not stipulated in this QCVN? Have you researched and updated this issue? For example, Long Phu, Song Hau 1, Vinh Tan power plants...?

- In this issue, propose JICA consultants should research and add some articles to cover the new technology: critical boiler, supercritical boiler. (Mr. Long)
  - In this time of the project is not enough time to add new articles. JICA may give them in guideline. (JICA)
- (4) There are no mandatory requirements for the type of power plant is equipped with frequency control system for power system to avoid power network collapse; QCVN has no provisions about Bypass valves for power plants?
- Lack of time. (JICA)

**2. Mr. Tran Duc Tue – Expert – Binh Son petrochemical plant**

- (1) The content of the articles in Vol.6 is too long, not according to the criteria of QCVN: give the minimum requirements?
- Such content is suitable, cannot be cut short again. (Mr. Long)

**3. Mr. Vu Ta Thong: Expert- Production Technology Department – EVN:**

- (1) Article 146: should add monitoring the characteristic point of superheated steam temperature, metal temperature, and speed up load of boiler.
- Lack of time. (JICA)

**THERMAL GROUP– ETC1**  
**Trinh Van Yen**

## **5. WORKSHOP REPORT ON THERMAL GROUP IN HA NOI (28/Jun/2011)**

### **I. GERNERAL WORKSHOP SESSION:**

#### **1.1. Chair a meeting:**

- (1) Mr. Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade

#### **1.2. Participation:**

- Participation:

- (1) Experts - Department of Science and Technology – Ministry of Industry and Trade
- (2) Experts - Department of Science and Technology – Ministry of Construction;
- (3) Experts of JICA project Team – Japan
- (4) Experts of Electric Viet Nam– EVN
- (5) Sub-consultant group - ETC1
- (6) Guests - represent the units - the invited list was agreed by JMC

#### **1.3. Time:**

Begin: 8: 40 AM, June 28, 2011 at Melia Hotel–Hanoi Capital

#### **1.4. The comments in the workshop session:**

Not mentioned in the report of the group.

### **II. WORKSHOP SESSION OF THERMAL GROUP:**

#### **2.1. Chair a meeting:**

- (1) Mr. Nguyen Van Long: Expert - Department of Science and Technology – Ministry of Industry and Trade
- (2) Mr. Vu Ta Thong: Expert – Department of Technology – EVN
- (3) Thermal expert group of WEST JEC – Japan

#### **2.2. Participation:**

- (1) Sub-consultant group - ETC1
- (2) Guests of thermal group, representing the units as listed in the table below

| No | Name              | Working position                      | Unit  | Phone      | Mail                        |
|----|-------------------|---------------------------------------|---|------------|-----------------------------|
| 1  | Nguyen Xuan Bac   | Chief of Electric –Relay department   | Habac Nitrogenous Fertilizer and Chemical Company Limited | 0915066392 | xuanbacdhh@yahoo.com        |
| 2  | Ngo Quy Tho       | Technical staff                       | Habac Nitrogenous Fertilizer and Chemical Company Limited | 0985213699 | ngoquytho23@gmail.com       |
| 3  | Bui Minh Tuan     | Deputy derector                       | Cao Ngan Thermal Power Plant                              | 0912104803 | tuancnpc@gmail.com          |
| 4  | Vuong Dinh De     |                                       | Cao Ngan Thermal Power Plant                              | 0983177925 | vuongdinhde1974@gmail.com   |
| 5  | Nguyen Ngoc Thang | Deputy chief of safety and technology | Ninh Binh Thermal Power Plant                             | 0912481313 | thangnbinh@yahoo.com.vn     |
| 6  | Nguyen Van Linh   | Deputy derector                       | Cam Pha Thermal Power Plant                               | 0913260729 | linhndcn@gmail.com          |
| 7  | Nguyen Viet Cuong | Technical department                  | Vinacomin Thermal Power Plant                             | 0906098491 | nvcuong_mpei04@yahoo.com.vn |
| 8  | Tran Van Son      | Safe and technical staff              | Uong Bi Thermal Power Plant                               | 0985887556 | sonstv_ubi@evn.com.vn       |
| 9  | Thai Van Quang    | Expert                                | PV-Power  | 0976707979 | thaiivanquang@pv_power.vn   |
| 10 | Nguyen Thanh Nam  | Expert                                | PV-Power  | 0916078988 | namnt@pvn.vn                |

**2.3. Time:** begin 10:40 AM

**2.4. The comments in the workshop session:**

**A. Comments in session B1:**

**1. Mr. Long – MOIT:** Explain:

- (1) New QCVN is established according to the current affiliation process and updating new technologies;
- (2) Vietnam needs new QCVN to advantage for the management of the State as well as create a legal framework for activities of Thermal Power Plants.

**2. Mr. Nguyen Ngoc Thang:** Ninh Binh Thermal power plant:

(1) Regarding the relationship between QCVN and Guideline:

- 1) QCVN is mandatory, Guideline is voluntary, so the location of the Guideline such that, isn't it?



- 2) Because the Guideline explain for QCVN, set way to satisfies the requirements of QCVN, so if the owners use the guideline in the contract then has conflict about criteria with contractors or equipment suppliers et being , hasn't it? If has conflict, how to resolve it?
  - In QCVN never specific regulate that is only general provisions, give the minimum requirements. So there will be no conflict of criteria such as participant mentioned. The specific provisions are stipulated in the contract with the contractor with plant. (JICA)
- (2) Because the Guideline is voluntary, the contractors also apply international standards are voluntary. Thus, when conflict occurs, Guideline (QCVN guide) will have no high legal, will not it?
  - Both parties must agree in the contract about the applied standard. (JICA)

**3. Mr. Vu Ta Thong:** Expert – Department of production technology –EVN:

- (1) In the draft QCVN for thermal power plant design, must have provisions about the manufacture of safe boilers, they comply with an international standard or a standard Vietnam.
  - The contract must require providers comply with an international standard or a standard Vietnam. (JICA)
  - The international standards are not exactly alike but requirements quite similar. (JICA)
- (2) How many Management Handbook "Administration manual" is there? In guideline has "Administration manual", has not it?
  - Handbook of plant management is very important documents of the plant, the plant must be manually set. (JICA)
  - This model is similar in Japan; we emphasize the independent safety measures. When the incident occurred, will have measures to promptly handle follow the scripts are available. (JICA)
- (3) Should the guides have the contents of Administration manual?
  - In the Administration manual ex officio contain contents in the guideline but in the Guideline do not contain Administration manual. (JICA)

**B. Comments in session B2:**

**1. Mr Vu Ta Thong:** Expert – Department of technology –EVN:

- (1) In the new design QCVN - Article 10: classification of gas turbines of Japan is different to international, is not it?
  - There are many different classifications; this is only a classification of the JICA side, and can choice other. (JICA)
- (2) In QCVN new design, in the 9 table 5, need to be clearly annotating the parameters, not it?
  - Parameters are not in parentheses are the parameters of current units have, but the parameters in parentheses are the parameters intended for the units in the future. (JICA)

**2. Mr. Nguyen Van Linh:** Deputy Director – Cam Pha Thermal Power Plant:

- (1) In QCVN vol.5 not mention CFB boilers - now used in many plants of VINACOMIN Group - propose addition.
  - QCVN vol.5 only mention to the most common problems. We will research and give into the guideline. (JICA)
- (2) QCVN vol.5, Article 146.a7.4, SO<sub>x</sub> removal equipments only in accordance with traditional boiler and does not match the CFB boiler, does it?
  - We confirm it is correct. (JICA)
  - Propose JICA additional study. (Mr. Long)

**C. Comments in session B3:**

**1. Mr. Vu Ta Thong:** Expert – Department of production technology –EVN:

- (1) In QCVN Vol.6, in the article 385, said about the oil system: need explain what kind is oil?
  - This is the control oil. (JICA)
- (2) Need provisions add for lubrication oil?
  - QCVN Vol.6 regulate about the operation that the lubricant has into the design part so we will put in QCVN on design. (JICA)
  - The specific contents will be in the guideline. (JICA)
- (3) The thermal power plants damage super-heater a lot, in the Vol-6 no have contents that mention to monitor metal surface temperature of super-heater?
  - We will discuss in group meeting and answer later. (JICA)

**THERMAL GROUP– ETC1**  
**Trinh Van Yen**

## 6. Minutes of Breakout Session of 3<sup>rd</sup> Workshop in HCMC (Thermal Power Group)

|  |          |   |
|--|----------|---|
| Date and Time:   |          | 26/Oct/2012 10:10 ~16:30  |
| Vietnamese Counterpart:  |          | Listed as follows   |
| Venue:   |          | Caravelle Hotel (3F) in HCMC                                    |
| Participants:  | MOIT     |   |
|  | EVN      |   |
|  | ETC1     |   |
|  | JICA     |   |
| Contents   |          |   |
| 1. Date and time, venue, participant   |          |   |
| (1) Participants   |          |   |
| Affiliation  | Group    | Name or numbers   |
| MOIT   |          | Mr. Long  |
| EVN  |          | Mr. Viet, Mr. Thong   |
| ETC1   |          | Mr. Trinh Van Yen, Mr. Nguyen Tuan Anh                          |
| Thu Duc TPP  | EVN      | Mr. Cao Hoang Dieu, Mr. An Nguyen Dinh Thao, Mr. Pham Quoc Thai |
| Phu-My-3   | IPP      | Mr. Nguyen Van Thanh  |
| Ca Mau   | PV-Power | Mr. Tran Cong Nguyen, Mr. Thai Hoai Thanh, Mr. Nguyen Huu Le    |
| Nhon Trach-1   | PV-Power | Ms. Dao Van Ha, Mr. Nguyen Ngoc Buu Kiem                        |
| Nhon Trach-2   | PV-Power | Mr. Nguyen Minh Hoang, Mr. Ha Tuan Anh                          |
| PECC2  |          | Mr. Ninh Quoc Trung   |
| PECC3  |          | Mr. Tran Van Lam  |
| PECC4  |          | Mr. Nguyen Quang Trung  |
| JICA   |          | Mr. Koga, Mr. Imamura, Mr. Higo                                 |
| Interpreter  |          | Ms. Thu   |
| Total  |          | 23 persons  |
| 2. Handout materials   |          |   |
| (1) Guideline Vol.4 VN version   |          |   |
| (2) Guideline Vol.5 VN version   |          |   |
| (3) PPT: How to use guideline  |          |   |
| (4) PPT: How the Technical Regulation and Guideline should be for Electrical Facilities      |          |   |
| (5) Survey questionnaire on degree of satisfaction and requirement for technical regulations |          |   |

and guidelines of Thermal Power Plant Part and facility

(6) Questionnaire for WS

3. Opening address of Mr. Long of MOIT

Today, I would like participants of the WS to discuss their opinions mainly.

4. Vol.2 (Design guideline): (Mr. Koga)

(1) Explanation about overview of Japanese legal system pertaining to the power industry and history of replacement into performance requirement

- 1) I prepared the material in a hurry and would explain above, since it was requested in WG on 23/Oct from Mr. Cuong of MOIT.
- 2) The Japanese technical regulation prescribe only pure technical requirement for safety and others are prescribed in the implementing regulation, though it may be regarded that all matters of technical and relating to the enforcement are specified in the technical regulation. We JICA experts present the technical regulation along with it.
- 3) The Japanese technical regulation requires to Owner the voluntary security by means of the compliance with the technical regulation, the development and observation of the administration manual and the appointment of chief engineer and supervision by him.
- 4) On the other hand, the state reserves the complementary system to ensure safety by direct supervision such as submission of construction plan, submission of the administration manual, on-the-spot inspection, penalty regulation and the like.
- 5) The technical regulation was replaced into performance requirement type 15 years ago and the system that the state specifies detail has changed to one that Owner can select by themselves.

(2) How to use guideline

- 1) For planning and design, it is fundamental to purchase of safety equipment that Owner should establish firm EPC Contract and purchase specification while meeting the minimum requirements of technical regulation.
- 2) For inspection and operation, it is fundamental to inspect and operate facilities according to the administration manual which is developed by themselves in line with the status of their plant. We introduce basic 15 items required for the administration manual.

(3) Subject of discussion

- 1) Please raise hand who has read Draft Guideline Vol.2 in advance before joining this session today. (Mr. Koga)
  - 14 persons per 16 persons.
- 2) What kind of feeling or opinion comes out at your power plant after reading the technical regulation and for Vol.2? (Mr. Koga)
  - In particular, no reaction.
- 3) Do you feel TCVN are substantial? Do the person who are working in the power plant access to the TCVN database by themselves and purchase those relating to the planning and design of the power plant? (Mr. Koga)
  - We refer TCVN at the planning and design, since there are many TCVN for the planning and design. The consultant present what kind of TCVN should be referred. (Nhon Trach)
- 4) Do the person who are working in the power plant access to the international standard database by themselves and purchase those relating to the planning and design of the power plant? (Mr. Koga)
  - We refer international standards at the planning and design, since there are many international standards for the planning and design. The consultant present what kind of international standards should be referred. (Nhon Trach)
- 5) Who will develop the EPC Contract and purchase specification on what? (Mr. Koga)
  - Basically, such work is asked to the consultant. (Nhon Trach)
- 6) Does the O&M Manual, instruction manual, drawing and the like prescribe clearly in the EPC Contract or purchase specification to deliver at the same time as the equipment, when purchasing the power plant or power facility? (Mr. Koga)
  - They are prescribed in the EPC Contract or purchase specification clearly. (Nhon Trach)
- 7) Is the solution method for the unachieved performance or defects prescribed in the EPC Contract and purchase specification clearly and is it verified and processed accordingly? (Mr. Koga)
  - The performance validation is performed. The defects would be resolved in the course of reliability run by means of providing punch list. (Nhon Trach)

8) How the completion inspection of IPP will be performed, though the completion inspection of the national project will be performed by the joint inspection of acceptance committee as the final inspection of construction? Is it the voluntary inspection by Owner? (Mr. Koga)

- It is difficult to define the IPP in Vietnam. Basically, the completion inspection is performed under the responsibility of Owner of IPP. (Nhon Trach, Phu My-3)

5. Electrical matters of Vol.2, 4 and 5 of : (Mr. Imamura)

(1) Technical regulation and guideline

- 1) There are two countermeasures of technical regulation to the recent diversification of electrical equipment in the view point of the regulation. First way: to be the specification type provision, second way: to be the performance requirement type provision and supplement by its interpretation and guideline introducing sample. Among them, the second way is the reasonable solution that can cover all of technical equipments rather than the first way that technical regulation may not keep up with the progress of technology
- 2) It is necessary to establish the technical regulation in the performance requirement type from the view point of diversity of technology for electrical equipment and international harmonization according to the safety requirement as shown in Vietnamese Standard Act, Electricity Act and comparison between the performance requirement and the specification requirement.
- 3) Therefore, the technical regulation has been established according to the basic policy of performance requirement that “use status of electrical equipment must function safely so as not brought the harm and risk to human and surroundings”.

(2) Subject of discussion

- 1) Do you know the penalty provision for nonconformance to T/R in the Vietnamese technical regulation? (Mr. Koga)
  - There was no specific reaction.
  - (Mr. Long returned at this moment.) There is a strict penalty and fine system in Japan and they are in the support of force of mandatory regulation. (Mr. Koga)
  - What is the concrete example? (Mr. Thong)
  - State is capable order for Owner the instruction such as stop, repair, relocation and modification of generation facility, it will not be able to generate as the result. If there is still no corresponding, penalties or fines will be applied. (Mr. Koga)

- The on-the-site inspection can be carried out to doubtful power plant that has many troubles. Such system is in the support of force of mandatory regulation. (Mr. Koga)
- I understand the content of such example. Even old norm of Vietnam has been compliance 100%. If there is a violation, severe punishment have been carried out in Vietnam too. (Mr. Thong)
- I have not confirmed by myself whether there is the penalty provision or not. (Mr. Koga)
- I want return the discussion to exchanging opinions. (Mr. Koga)
- I have asked JICA short presentation and asked to keep time obtaining opinions from participants as much as possible. (Mr. Long)
- There is the penalty provision also in Vietnam; the director of power plant was punished in case of violation. (Mr. Long)
- We are asked to explain the legal system of Japan and performance requirement depending on the request by Mr. Cuong of MOIT on 23/Oct and are explaining hurriedly. Therefore, it takes time. I want to return to main flow chaired by Mr. Long. (Mr. Koga)

2) General comments for Electrical

- I ask comments about overall electricity matters. (Mr. Koga)
- I would confirm about SCADA. (Mr. Thong)
- I ask opinions of participants from power plant and Consultant Company, since Mr. Thong is the WG member and he has a chance to speak. (Mr. Koga)

3) Periodical inspection in Vol.5

- When I read the contents of the periodic inspection of Vol.5, I feel dissatisfaction on the contents as a person who is doing the actual work. I understand that “certification: what is obliged) and (inspection: voluntary one), though two representations of certification and inspection have been used in this. I ask to clarify the frequency of periodical inspection of electrical equipment and identify verification body. (Nhon Trach)
- I think there is no regulation of inspection for electric facility other than QCVN 5&6, if there is no mandatory testing by some public office. QCVN 5&6 requires major inspection for BLR, ST, GT, G and the like within 6 years. The inspection for electric facility may be decided and performed according to the recommendation such as O&M Manual, etc. (Mr. Koga)
- We ask to describe about such procedure in the technical regulation, since the high voltage electric facility is necessary to be certified well by the designated

verification body such as EVN. (Nhon Trach )

- Another group is responsible for the network facility. We don't grasp whether there is the system to verify the high voltage electric facility in the power plant by EVN or not and about the rule written in regulation other than power plant. (Mr. Koga)
- Has EVN come to inspect the high voltage facility in power plant of Phu-My-3? Will inspection of the facility in the power plant such as CT, VT and the like be done by EVN? (Mr. Koga)
- Those owned by EVN must be used the test and measurement device. There is one agency in Hanoi, though CT and VT with class 0.2 must be used under the Electric Act. (Ph My-3)
- Please submit comment in the comment table due to the limited time, though ETC should grasp the most. (Mr. Koga)

Note) The followings are confirmed after B2 session. As a way of Vietnam, the specific electric facility in the power plant is required to inspect by outside designated agency in addition to the house inspection. (Nhon Trach)

- We don't prescribe such inspection in the technical regulation for generation facility if there is other regulation requiring such inspection, since it will be a duplicate. (Mr. Imamura)
- Which version are the certification and inspection used in whether Vietnamese or English? Unstructured representation in English version is responsible for JICA expert, the mistake in Vietnamese version is a matter of translation. (Mr. Imamura)
- In Vietnamese version. (Nhon Trach)
- Is the previous comment that the content of periodic inspection in Vol.5 is unsatisfactory compared with the inspection manual? The guideline is the interpretation of technical regulation, sample of explanation and described only common items. Therefore, it is no sense to compare with the manual which the inspection instructions is described. (Mr. Imamura)
- That is so. I understand what has been explained. (Nhon Trach)

## 6. Mechanical matters of Vol. 4&5: (Mr. Higo)

### (1) Subject of discussion

#### 1) GL Vol.5 Article 162: vibration value at alarming and stopping steam turbine

- We set up the auto-stop limits value of vibration as 0.125mm at rated speed in our power. It seems too large that the auto-stop limits value of vibration as



- 0.25mm at rated speed in this Vol.5. in our power. (Thu Duc)
- The recommended stopping limit value by manufacture is 0.25mm, not mandatory one. (Mr. Higo)
  - Why are there two values, though it is not mandatory one in Vietnam too? Alarm will be appeared frequently. (Thu Duc)
  - Because there are value for speed-up and speed-down. (Mr. Higo)
  - The recommended value is introduced in Guideline Vol.2 Article 33-1-2 too. The auto-stop value is set in twice as the alarm value on JIS standard, though there is difference between voluntary standards and the alarm value, auto-stop value will vary depending on the number of rotation. (Mr. Koga)
- 2) B-3 session from now: I ask to confirm the unclear and improper matters regarding T/R and GL from participants about 50 minutes. (Mr. Long)
- 3) Article 189 of T/R Vol.2: Description of “outdoor oil tank with capacity less than 1,000m<sup>3</sup>”
- This was the misinterpretation of questioner. (PECC3)
- 4) Item-5 of Article 20 T/R Vol.2
- It is better to describe “power plant with the oil tank” instead of “it is preferable to provide the oil tank”, since there is the power plant with no oil tank. (PECC3)
- 5) Article 102 in GL Vol.4: Example of fuel composition
- I ask to introduce the sample such coals produced in Vietnam or Australia, since Vietnam is importing them, though the coals produced in USA and Canada as sample coal for composition. (PECC3)
  - Please refer the example of coal composition of Australia, China, Canada, Indonesia and South Africa introduced in Article 43-1-1 “coal handling facility” in Vol. 2 GL. (Mr. Koga)
  - Also light oil is used in addition to coal, gas and heavy-oil in Vietnam. There is no example. (Thu Duc)
  - Please refer the example of light oil composition introduced in Article 59-1 “oil handling facility” in Vol. 2 GL. (Mr. Koga)
- 6) Article 161 in GL Vol.5: Turbine drive boiler feed-water pump
- The motor drive feed-water pump is applied for the 300MW class plant, though the turbine drive feed-water pump is explained in this Article. The

motor drive feed-water pump is used for the European plant. (PECC3)

- The feed-water pump changes from the electric drive one to the steam turbine drive one for large power plant. The steam that generated own boiler is used. (Mr. Koga)
- I know that the turbine drive one is used in 500MW to 1,000MW class plant. However, the electric drive one has the benefits and the foreign capital from Europe will easy to get into Vietnam in future. (PECC3)
- The electric drive one is a waste, though it is easy to control in the small power plant. It is lack of awareness that the only electric drive one is used in Europe. In large power plant, it will become the turbine drive one. There are some cases that the turbine drive feed-water pump is installed next to the main steam turbine. (Mr. Koga)
- The turbine drive feed-water pump is applied to above 500 to 600MW class plant in Japan. However, the motor drive feed-water pump is also provided, since steam is not available at start-up. It will be the reserve machine. The turbine drive feed-water pump is selected from economic efficiency. However, there are disadvantages such as warming and vibration, since it is the high temperature equipment. (Mr. Koga)
- I ask to keep the range of number and capacity for reserve pump so as that Owner can select. (PECC3)
- The technical regulation doesn't force to be the electric drive. Owner should seek economical and stable equipment. The technical regulation requires providing feed-water equipment that is capable to supply the amount of water for the maximum evaporation of boiler as the technical requirement, however, the type of water source and numbers to achieve is left to the choice of Owner. (Mr. Koga)
- The meaning may be compulsory in the Vietnamese version GL. (PECC3)
- Basically, "shall" is described as the meaning "intended to be forced legally", "must" is described "adhere to the conventions. (Mr. Higo)

7) Article 245 Fig-245-1 in GL Vol.4: Coal ash

- This figure is applicable to coal ash, but is not applied to gas turbine facility. Ammonia is not used in Vietnam. (PECC3)
- We don't call the solid component coming from the de-nitrification equipment as ash. We mainly call the burning debris as ash. Vanadium ash appears in case of heavy-oil firing. The other method to injecting ammonia in order to remove NOx in case of the gas turbine. (Mr. Koga)
- We don't want to stipulate the ammonia injection method. It costs. There is

other method to apply steam too. (PECC3)

- I advise you that it is not possible to apply because you have not done currently. The ammonia injection method to remove NOx in flue gas is widely applied. Owner is capable to select the method. (Mr. Koga)

8) Wrong translation in Vol. 4&5

- There is miss-translation Vol. 4&5 and difference of recognition about technical term. (Thu Duc)
- English mistake is the mistake of JICA experts and Vietnamese mistake is the mistake of ETC1. (Mr. Koga)

7. Common matters

- (1) I ask to provide the detailed content to the item level in the table of content. (Nhon Trach)
- (2) The table of content is limited to the section title level in Vol.4&5, though the table of content is limited to the item level in Vol.2. We don't perform, since it increase number of pages and is the common matters in all fields. (Mr. Koga)
- (3) Isn't it better to provide the provision of diesel power generation equipment in the part of electrical equipment? (Nhon Trach)
- (4) It is the reason why the provision of diesel power generation equipment is provided in the part of existing QCVN. Please be regarded it as the emergency power supply equipment. The diesel power generation equipment for such as the private power generation equipment in the industrial park is out of scope of this project. (Mr. Imamura, Mr. Koga)
- (5) Why are there missing items? (Nhon Trach)
- (6) It is because that thermal portion has been withdrawn from the cooperation among the various fields. (Mr. Imamura)
- (7) The translation of chapter-15 is reversed. (Nhon Trach)
- (8) Please be pointed it out in the comment table. (Mr. Imamura)
- (9) Please bring back the questionnaire which has been distributed in this morning and submit it along with the comment table at a later date. (Mr. Higo)

EOD

## 7. Minutes of Breakout Session of 3<sup>rd</sup> Workshop in Hanoi (Thermal Power Group)

|   |              |   |
|---|--------------|---|
| Date and Time:                                |              | 30/Oct/2012 10:10 to 16:20~   |
| Vietnamese Counterpart:                       |              | Listed as follows   |
| Venue:  |              | Melia Hotel (2F) Function room 4  |
| Participants:                                 | MOIT         |   |
|   | EVN          |   |
|   | ETC1         |   |
|   | JICA         |   |
| Contents                                      |              |   |
| 1. Participant                                |              |   |
| Affiliation                                   | Group        | Name or number  |
| MOIT  | -            | Mr. Nguyen Van Long   |
| EVN   | -            | Mr. Viet and Mr. Thong (only general session-1)   |
| ETC1  | -            | Mr. Trinh Van Yen, Mr. Nguyen Tuan Anh  |
| Pha Lai TPP                                   | EVN          | Mr. Pham Ba Than, Mr. Nguyen Van Cuong  |
| Uong Bi TPP                                   | EVN          | Mr. Pham Xuan Khoai   |
| Hai Phong TPP                                 | EVN          | Mr. Cao Xuan Nhung  |
| Cam Pha TPP                                   | TKV          | Mr. Vu Xuan Trinh   |
| Quang Ninh TPP                                | EVN          | Mr. Nguyen Van Luong, Mr. Nguyen Xuan Long  |
| Cao Ngan TPP                                  | Vinacomin    | Mr. Dinh Quang Vinh   |
| PECC1   | -            | Mr. Le Van Dung, Mr. Phan Trong Khang   |
| Institute of Energy (IE)                      | -            | Ms. Le Thu Ha, Mr. Nguyen Hoang Son   |
| PV-Power                                      | Petrovietnam | Mr. Le Van Than, Mr. Mai Van Long, Mr. Nguyen Minh Tuan, Mr. Nguyen Van Hoang, Mr. Ha Duc Thu |
| PMB of LP-SH<br>PV-Power                      | Petrovietnam | Mr. Phan Chanh Truc   |
| Vinacomin-Power                               | Vinacomin    | Mr. Nguyen Quang Hung   |
| Thermal Association of<br>VN                  | -            | Mr. Truong Duy Nghia, Mr. Mai Cong Mung,  |
| Hanoi University of<br>Science and Technology | -            | Mr. Le Duc Dung   |
| University of<br>Technology/IE                | -            | Mr. Bui Hong Son  |

|             |   |                                 |
|-------------|---|---------------------------------|
| JICA        | - | Mr. Koga, Mr. Imamura, Mr. Higo |
| Interpreter | - | Ms. Thu                         |
| Total       |   | 30 persons                      |

2. Handout materials

- (1) Guideline Vol.4 VN version
- (2) Guideline Vol.5 VN version
- (3) PPT: How to use guideline
- (4) PPT: How the Technical Regulation and Guideline should be for Electrical Facilities
- (5) Survey questionnaire on degree of satisfaction and requirement for technical regulations and guidelines of Thermal Power Plant Part and facility
- (6) Questionnaire for WS

3. Opening address of Mr. Long of MOIT

Today, I would like participants of the WS to discuss their opinions mainly.

4. Subject of discussion

(1) Breakout session-1 (10:10 to 11:40)

1) How to preside over the WS

- We would like not to give a presentation to the participants from the Japan International Cooperation Agency (JICA) team, but to discuss their opinions with JICA team mainly in this time breakout session. The drafts of the technical regulation (TR) and guideline (GL) have been already distributed on CD-ROMs. (Mr. Koga)
- I would like to receive comments on the draft of the GL from the participants in the today's WS because I have already received comments on the draft of the TR. The drafts of the GL are composed of 5 volumes and are explanation of the draft of the TR. I would like to have comments on design if there is a lack of contents in volume 2 when you employ it in your work. (Mr. Long)
- I belong to Vietnam Thermal Association (VTA), and have inspected about 40 reports of project, design and feasibility study and the like as a member of the VTA, and am most embarrassed that there is a lack of the TR and standards for Vietnamese thermal power plant. I would like to express my appreciation to the cooperation of the JICA on this project taking that background into consideration. Today, I would like to confirm a way of thinking and policy of development of the TR/GL because comments on the each individual item have been submitted to the MOIT separately. (Mr. Nghia)

- 2) The way that new TR/GL should be
- I checked 50 kinds of technical standards that apply to a power plant which is constructed in China with reference to the standards listed in the TR/GL, and could not refer to some of them. The JICA team said that it should leave to an owner's discretion to decide capacity of facilities on a new thermal power project, but it cannot be mandatory. I would like the MOIT to be provided specific detailed regulation such as old norms because if there is not a technical regulation for each facility, an entrepreneur carries out it on their own initiative that capacity of a coal stock yard of a power plant is different from 3 weeks to 2 months, and it is enough or not that what percentage of margin takes on discharge capacity of a boiler feed water pump. (Mr. Nghia)
  - Regarding how the TR should be fundamentally, Mr. Nghia has an old type idea, and the new developing TR does not suit that idea, now then, how idea does the MOIT have? (Mr. Koga)
  - Many comments are highly appreciated because the TR/GL is used for field engineers from view point of the state governing body and I would like to reflect their comments into the TR/GL after examining them. The TR has few specific numerical values but the GL has some ones, I would like to have your comments on the TR/GL after comparison of them. (Mr. Long)
  - The JICA's opinions are as follows;
  - The GL is not a standard, and also does not have legal status. Therefore, it is not desirable to compare the GL and China standards; Because an owner should decide the capacity of a coal stock yard, the T/R does not provide a specific value of the capacity; With respect to the discharge capacity of a boiler feed water pump, the T/R only provide that boiler feed water equipment to feed maximum evaporative capacity of the boiler, and an owner should voluntarily decide a concrete how to achieve in consultation between the owner, and consultants and/or manufacturers; Most important matter is that the T/R provides minimum requirements security and safety for the thermal power plant, and the GL contains one of their examples, etc. The JICA team never takes the security and policy of Vietnamese state energy supply into consideration. (Mr. Koga)
- 3) The contents of the GL and its legal status
- I would like the MOIT to be provided that the GL contains what are, if possible, detailed concrete, practicable, and applicable contents in design, operation and inspection. For example, the GL contains that it is better to purchase coal from the United States of America, Canada and Australia as much as possible in the page 3 of the volume 4; however, Vietnam does not

purchase those countries but Indonesia. (Mr. Mung)

- The legal status of the mandatory regulation and voluntary standard is not understood. Many personnel involved in electric power misunderstand the TR/GL as mandatory regulation and its detailed regulation. The GL does not contain a manner of writing that it is better to purchase coal from the United States of America, Canada and Australia. The GL is only reference for personnel who do not know what they should do with the TR alone. It is a composition of the new TR with self-responsibility that an owner himself studies international standards, consults EPC contractor, and can purchase equipment by self thinking without detailed order from the state. (Mr. Koga)
- It meaningless that it is better to purchase coal from the United States of America, Canada and Australia as much as possible. (Mr. Mung)
- As a participant made a comment now, I would like the JICA team to reflect the comment focused on three points which are detailed concrete, practicable, and applicable into the contents of the GL. (Mr. Long)
- The GL does not have the legal status and is also not mandatory matter. The word of applicable is only used for the mandatory regulation. The GL does not have any nature to which must be conformed. As for the comment on detailed contents as much as possible, it is response to the comment that the contents of the GL would reach a certain realistic compromise by limiting to resources commissioned by the JICA. In the strongest terms, the GL is not absolutely essential for personnel who plan construction of a power plant or maintain operation of a power plant. It is most important matter that practical inspection and operation are not performed based on the GL but an administration manual prescribed by the personnel themselves or an internal regulation which prescribes how the power plant is operated. The GL for design is not directly used for purchase specifications, EPC contract and equipment specifications are determined by an owner depending on budget plan, the GL is one of the many references which are referred together with the international standards when developing specifications. (Mr. Koga)
- I would like the MOIT to provide contents which are suitable for Vietnamese actual circumstances because the GL will be used for Vietnamese. (Mr. Mung)
- As for the comment that the GL should be practicable, it is response to the comment that the GL does not close the doors to new technologies in the future. A new technology could be adopted within self-responsibility if the new technology comes up and that is demonstrated for practical use. It is not better to think that the contents of the GL are useless since that is not practical at the present time. With respect to the comment that the contents which are

suitable for Vietnamese actual circumstances are desired, it is response to the comment that the present draft of the GL is global standard. (Mr. Koga)

- Detailed enforcement regulation is promulgated as a law, decree and ministerial circular in the legal system. If the GL is promulgated as the ministerial circular, the GL will be mandatory. (Mr. Nghia)
- The GL will not be the ministerial circular. (Mr. Long)
- I thought that the GL was mandatory item which was required to perform at least in a power plant until I came here, but I realize that the GL is supplementary explanation. If this is correct, based on what does the MOIT evaluate many power plants as the state governing body? If there is not mandatory common rule, is it possible that the MOIT governs them? (PV-Power)
- The TR is mandatory and GL is not mandatory. What each individual power plant must conform to is governmental orders (mandatory regulations), O&M manuals by manufacturers and regulations by the state governing agencies. Since the TR contains mechanical and electrical matters, I would like to have comments on it. (Mr. Long)
- I would like to express my opinion as a third party. Old days, Japan had a periodic inspection system that inspectors got into and inspected a power plant however; it has been already changed into the system that an owner must perform the periodic inspection voluntarily. The state is required to grasp and deal with security concerned and big problems, the state agency like the MOIT requires to report a power plant having incidents by the incident reporting system and collects statistics on the incident. An owner is required to decide and perform daily management, leaving this aside; the stat agency is required to have the system both to inspect and investigate a problem power plant, and to give notification of a need for corrective action. (Mr. Koga)
- My comment to the MOIT is that how to develop the TR/GL is no problem, but a way of thinking of developing them is same as the way of thinking of Mr. Nghia. I would like the MOIT to detail the contents of the GL because the GL has a status which is interpretation or supplementary explanation to perform the TR, and to show practical technical training and education in the GL. Then, is there what is like this TR/GL in Japan? My other comment to the JICA team is that if there is, it is better to translate those and adapt those to the Vietnamese circumstances. (PV-Power)
- If the how to develop the TR/GL means the legal status, it is probably understood. As for the comment that the contents of the GL should be detailed as much as possible, the GL just shows one of examples and references, and



accordingly I would like you to exert yourself to study TCVN, documents and international standards. It is response to the comment that it is unreasonable to develop the GL which satisfies everyone who stands various positions. It is required for you yourself to purchase and read related international standards. In addition, the TR/GL only covers technical requirement for security for facilities, and not practical technical training and education. Another statute provides the practical technical training and education in Japan. With respect to the second comment, it is response to the comment that Japan has the technical regulations revised before 15 years as global standard and the TR/GL developing at the present time is based on these. (Mr. Koga)

(2) Breakout session-2 (13:35 to 14:45)

1) Unit and power plants which the TR cover

- If the JICA side is going to give a presentation to the participants, I would like you to go ahead with the presentation. (Mr. Long)
- The JICA side is not going to give a presentation to the participants at this time. It is one of ideas to discuss opinions from the participants as during the morning. If there is not any comment, it is one of ideas to ask related questions to the TR/GL from the JICA team. (Mr. Koga)
- I would like to have comments on the TR/GL from the participants of Vinacomin-Power, PV-Power and various establishments. (Mr. Long)
- I would like the MOIT to use legal units in Vietnam, for instance not psi but MPa, in the TR. And, I would like the MOIT to propose my comment that the TR is only applied to all power plants connected to the national power transmission network and then the TR is not applied to all power plants in an industrial park, therefore the TR should be also applied to the power plants in the industrial park since the power plants may be connected to the national power transmission network in the future. (Mr. Nghia)
- The TR developing at this time is applied to all power plants connected to the national power transmission network because of limited budget and time; however, another new TR which is applied to power plants like that will be developed in the next project and the near future. There have been many comments like this until now. (Mr. Long)
- The units which are internationally effective are used for the TR. Because the JICA team is not entrusted with development of the TR from the MOIT, I would like the MOIT to convert the units into certain units used in Vietnam and replace with ones in the process of legislation. (Mr. Koga)

2) Voltage classification

- The contents and table 2 in Article 7, Volume 2 of the TR is different from

regulation No. 79952009 applied in Vietnam. (Mr. Nghia)

- As for the voltage classification in Article 7, Volume 2 of the TR, the revised TR was already submitted in Jul/2012. Therefore, is this comment not based on the former version of the revised TR? (Mr. Long, Mr. Imamura)
- The revised TR submitted in July has insufficiencies. (Mr. Nghia)
- The voltage classification was modified according to the document received from Mr. Yen of ETC. (Mr. Imamura)
- That is to say difference of the voltage classification. Which voltage do you mean the grid (transmission and distribution) voltage or bus voltages of electrical distribution system in power plants? (Mr. Koga)
- It is both voltages. (Mr. Nghia)
- The grid voltage is required to be determined beforehand, in the strongest terms, any voltages could be selected as the bus voltages as far as a step-up voltage matches the grid voltage. The voltage classification is to standardize the bus voltages. (Mr. Koga)
- JICA team's response does not meet my intention of the comment; I would like the JICA team to conform the voltage classification to the regulation applied in Vietnam (No. 79952009 conformed to the IEC). (Mr. Nghia)
- The voltage classification is intended to be conformed to the applied in Vietnam but if there is a point, it needs to look closely into the TR. The used voltages, even IEC and other international standards, are not unified, and it is required for Vietnam to decide that how voltages are intended to be unified because there are differences of voltage between the north and south area. (Mr. Koga)
- *Minutes about the voltage classification after this sentence were confirmed at the beginning of Breakout session 3.*
- The voltage classification was modified according to the circular (No.12/2010/TT-BCT) by the MOIT, the revised TR was already submitted in Jul/2012. In addition, Mr. Yen of ETC has just confirmed that the modified contents are correct. (Mr. Imamura)
- We agreed that the voltage classification had been revised. (Mr. Long, Mr. Nghia)

3) Classification by steam temperature & pressure, inlet gas temperature of GT and power output of power plant

- It is better to classify the technical regulation by specific value, though table 4, 5 in the technical regulation Vol.2 Article 9 shows the classification of power plant by steam pressure and temperature. It will disturb the investors to build a power plant with steam conditions other than in this table. (Mr. Nghia)

- It is better to provide a certain extent (acceptable range) for investors, if prescribing the specific numerical values. (Mr. Long)
- Table-6 in the technical regulation Vol.2 Article 10 which shows the gas inlet temperature of GT is different with the classification by type of GT that are used in the world. MHI classifies GT using the Model such as F, G and the like. (Mr. Nghia)
- It is correct that steam temperature and pressure must not prescribe in the technical regulation. This is the recommendation for easy designation. The steam temperature and pressure is not required as a minimum requirement, if the equipment is established with technology to some extent. The reason why classifying Gas temperature of GT is intended to meet the demand of Vietnam side which requested always from Vietnam side. The classification table which taking into account the current state of the world as the up-to-date information is intended to provided that it will not lead to an accident if the facility is planned to conform to this table, since it is a established technology. The halfway numerical value in MPa unit become a good numerical value of good cutting in pounds and inch unit. Those tables can be removed, if it is not appropriate. (Mr. Koga)
- The classification of table 6 is not used in any country. (Mr. Nghia)
- It is correct to classify by the inlet gas temperature, since the type of designation of GT by gas inlet temperature is deferent in each manufacturer. As the result, it is possible to remove table 6 from mandatory regulation, if such designation is not appropriate for Vietnam. (Mr. Koga)
- It is not better to provide table 6, since there is no meaning of the classification in table 6. (Mr. Mung)
- The higher the inlet temperature of GT, the required technical level such as material, heat-resistance and cooling method will be higher. It is not what is on the extension of the traditional technology. Therefore, table 6 is recommended to adopt as the common rule to grasp the technical level easily, though it is not mandatory matter. As the result, it may remove table4, 5, and 6. (Mr. Koga)
- It is better to classify by the output of production line (single unit capacity), since table 3 “classification table by output” in the technical regulation Ver. 2 Article 8 is only granted the designation and high possibility of misleading. (Mr. Nghia)
- The meaning of provision of table 3 is same as those in table 4, 5 and 6. Is not there power plant with output of 1,000MW in Vietnam? (Mr. Koga)
- There is no power plant with such large output at present, it has been planned. (Mr. Nghia)

- The technical level of the output of production line (single unit capacity 300MW) is not acceptable to the output of production line (single unit capacity 1,000MW) as it is. Table 3 is the recommendation to grasp easily the necessary technical level based on the classification of power project as national project. This output of power plant may be achieved by multiple generators or a single generator. It may remove table 3, since it is a suggestion to set the common designation that can be recognized by output. (Mr. Koga)
- It has a trouble that this table is exactly divided by the value of 600MW, since the output of production line (single unit capacity) has a range such 600~630MW or 650MW for 600MW. (Mr. Nghia)
- It is not allowed to operate power facility exceeding the nominal output of the generator nameplate in Japan. (Mr. Koga)
- We ask to consider the classification of power plant by output by MOIT. (Mr. Mung)
- I will bring back this matter and ask consultant to considerate it. (Mr. Long)
- It is better to remove the table-3 to 6 in the technical regulation Vol.2, if such designation is not useful. (PV-Power)
- Those tables can be removed. (Mr. Koga)

(3) Breakout session-3 (15:05 to 16:00)

1) Fire-fighting facility

- The title of Article 33 in Vol.4 is not appropriate, since the content is not explained, though it is “installation of the fire-fighting facility”. It is better to provide the reference matters from Article 9 of Vietnamese fire-fighting law which the details have been described greatly. (PV-Power)
- The requirement of facility must be prescribed in Vol.2, since Vol.4&5 prescribe the activity for the operation and inspection. Moreover, the fire-fighting facility ought to be not included in the power facility and be prescribing be the facility which is regulated by law and regulation of other ministry in Vietnam. (Mr. Koga)
- Certainly, it is regulated by other ministry. Since this Article mentions the fire-fighting facility, whether quoting Article 9 of Fire service Act or decree No. 35? (PV-Power)
- It is fact that we have not been capable to investigate law and regulation of other ministries and government agencies. We JICA regards that such demand must be reflected in the process of promulgation by MOIT by Vietnam side in order to enhance GL. (Mr. Koga)
- ETC will confirm the law and regulation relating to fire-fighting. (Mr. Yen)
- Please advise the result of such survey to Mr. Long of MOIT instead of JICA.

(Mr. Koga)

- It is not possible to refer the relating law and regulation, since they might be amended. (Mr. Long)
- It is very important for the government office what they regulate based on which law and regulation, since there is a side to regulate and a side to be regulated. It is a violation of the regulations to define the laws and regulations beyond the scope of its jurisdictions, since there is the range of a given jurisdiction to the government office. Therefore, it is impossible to establish laws and regulations that cover all equipments in the power plant, though it is easy to use for the power plant, if the laws and regulation is developed which cover all the equipment in the power plant. (Mr. Koga)
- It may only be quoted, since GL is the explanation of the technical regulation. (PV-Power)

## 2) Pressure facility

- There are safety regulation for the boiler, pressure piping and pressure vessel in any countries. Therefore, it is preferable to supplement “it shall be pursuant to the existing regulation for pressure facility in order to secure safe” instead of describing many concrete values. (Mr. Nghia)
- This is an issue of legal validity since when applying for anything. For example, it is general that the new law will be applied to the new power plant from the time when the law has been enabled and is not applied to the existing one. It is necessary to prescribe from time and anything to be applied at the end of the law and regulation. (Mr. Koga)
- The reference list of international standard is provided in GL. I ask to supplement the regulation which promulgated 50 years ago by MOLISA in order to ensure safe of pressure facility (currently it is in effect) in GL. (Mr. Nghia)
- Technical regulation Vol.1 prescribes to implement such regulation and to comply with other law and regulation of Vietnam. This requirement is applied to all of hydro power, thermal power and network. (Mr. Long)
- If the reference list is not sufficient or some standard should be quoted into the text of regulation, though the reference standard list such as TCVN, international standard and JIS in GL Vol.2, such work should be done by Vietnamese people who know the situation of Vietnam well rather than the few Japanese. The relevant laws and regulations have been referenced into other laws and regulations in Japan too; however, the law and regulation also will be updated automatically according to the revision of the original law and regulation. (Mr. Koga)

➤ I agree. (Mr. Nghia)

3) Protection for structure from rust

- We ask to provide the concrete measures, since present content is only inspection, though the title of Article 48 of GL Vol.4 is “protection for structure from rust”. (PV-Power)
- It may not be enough, if it is not specific. There are many specific methods how to do it, if focusing on this item. For example, generally coating of rust prevention painting, thermal spraying, oil coating on machined surface, cathodic protection equipment for pipeline and chemical oxide film on the evaporation tube of boiler are applied to prevent development of rust. (Mr. Koga)
- We ask to describe the effective measure, since it is depending on the budget which one to use. (PV-Power)
- It will link to when it should be used, if it has been provided the specific measures in turn. It is not possible provide detail, since this Article is the introduction to common. The cathodic protection for pipeline is described in Vol.2. (Mr. Koga)
- We ask to provide a sentence “the corrosion protection measure must be taken always” in the GL. (PV-Power)
- We don’t provide it in GL, since GL is not the mandatory. It is not useless, if it is supplemented without concreteness. It is necessary to examine by them instead of just asking to GL. (Mr. Koga)
- The comment for Article 48 of GL.Vol.4 will be recorded. It is better to supplement a sentence, since there are many measures for corrosion. (Mr. Long)
- Please refer the cathodic protection equipment for pipeline in GL Vol.2. Moreover, the technical regulation is the one in order to prevent instantaneous large accident due to, for example, destruction of drum or over-speed of steam turbine. Still, such deterioration which progresses slowly over a long period of time and is capable of handling is beyond the scope of this regulation basically. (Mr. Koga)
- Please send comments to the address which is announced, since there is a lot of problem, there are much material and not enough time. (Mr. Long)
- Please return the response to the questionnaire which is distributed today to Mr. Cuong of MOIT. (JICA)

EOD

## **Appendix-5.3**

### **Minutes of Workshop (Network Group)**

1. Draft Minutes of 1<sup>st</sup> Workshop at HCMC (Network) (March. 11, 2010)
2. Draft Minutes of 1<sup>st</sup> Workshop at Hanoi (Network) (March. 14, 2010)
3. Draft Minutes of 2<sup>nd</sup> Workshop at HCMC (Network) (June. 22, 2011)
4. Draft Minutes of 2<sup>nd</sup> Workshop at Nha Trang (Network) (June. 24, 2011)
5. Draft Minutes of 2<sup>nd</sup> Workshop at Hanoi (Network) (June. 28, 2011)
6. Draft Minutes of 3<sup>rd</sup> Workshop at Hanoi (Network) (October. 26, 2012)
7. Draft Minutes of 3<sup>rd</sup> Workshop at Hanoi (Network) (October. 30, 2012)

## 1. Draft Minutes of 1<sup>st</sup> Workshop at HCMC (Network) (March. 11, 2010)

|  |   |
|--|---|
| Date :   | 11 <sup>th</sup> March 2010 10.40 AM to 16.30 PM,   |
| Venue  | Caravel Hotel–Ho Chi Minh City Conference room  |
| Vietnamese Counterparts  | + Mr Dang Hai Dung: Vice Manager of Department of Science and Technology – Ministry of Industry and Trade<br>+ Mr Phuong Hoang Kim – Deputy Director General - Department of Science and Technology – Ministry of Industry and Trade;<br>+ Mr Tran Huu Ha – Deputy Director General – Department of Science and Technology – Ministry of Construction;<br>+ MOIT: Mrs. Hau<br>+ EVN: Mr. Khiem; Mrs. Lan Binh<br>+Sub-consultant group – Mr. Tuan and Linh ETC1.<br>+ Independent consultant: Mr. Trinh Kim Hung. |
| JICA member  | JICA Network Team Mr. Kuwahara, Mr. Aki, Mr. Yamada, Mr. Masuda,  |
| <p>Agenda of Workshop of Network</p> <p>Background of revision on Technical Regulations Vol.1 to Vol.7 under MOIT</p> <p>Proposed major revisions on the existing QCVN Vol.1 to Vol.4</p> <p>Proposed major revisions on the existing QCVN Vol.5</p> <p>Proposed major revisions on the existing QCVN Vol.6</p> <p>Proposed major revisions on the existing QCVN Vol.7</p>   |   |
| <p>The comments in the workshop session:</p> <p>* Mr. Dung (MOIT) briefly presented the purpose and requirements of the revised regulation in stages, as well as development standards consistent with the new regulations promulgated by the National Assembly. He simultaneously highlighted the goal for this conference that was to collect the opinions of all units, based on which JICA will receive a complete editing to prepare the final draft, then proceed to completed the first phase of the project in July 2011</p> <p>* Mr. Ken (Yonden Company) presented general policies, the purpose of compiling a new regulation. He also provided normative comparisons Vietnamese with Japanese and some international standards.</p> <p>Then, he presented general policies, the purpose of compiling revised regulation (Vol.5). The regulation does not change much because in 2007 the same group of Japanese JICA Vietnam has changed, but the comments to the regulations will also be considered if appropriate editing.</p> <p>* Mr. Cuu (ETC3)'s ideas:</p> <p>- Insulating oil is used extensively in electrical equipment. So that it is better to add a new item in the revised regulation in order to show out a new oil standards and operating oil. For example: In the Table 27-6 (page 5-13) - The Standard factors of Transformer Oil, it mentioned about electric resistivity, moisture content in oil, etc. This may be difficult to apply in the operation and need to be</p> |   |



changed.

- Mr. Ken has promised to consider this suggestion and also advise people to send their idea directly to group of expert concerned

\* Mr. Thang (Ho Chi Minh Power Company)'s ideas:

- In the Standard Table referring to testing transformer oil, given value of gas content in oil is incoherent and needed to be changed, for example, increase the value.

- To article 48- Testing voltage for underground cable, referring to Annex, Table 1-1 (page 5-97), given value is incoherent and needed to be changed to gain conforming to standards, such as standard of IEC-International Electro technical Commission

- In Vietnam, the grid network has no level voltage of 20kV, so it is needed to add necessary data of this in the annex, table 1-1 (page 5-97).

- To the table 33-2 (page 5-23): The standard for non synchronous three phases of 110kV and over OCB, the given value is less than 0.004sec and if it is needed to be changed to gain conforming to standards, such as standard of IEC-International Electro technical Commission.

\* Mr. Cuu (ETC3)'s ideas:

- If it should be applied the testing for surge voltage for all equipments? In fact, it is hard to apply this for 110kV and over equipment. However, this may be applied for 35kV and under equipment.

- Testing power cable should be provided into two sections: Medium Voltage (35kV and under) and High Voltage (110kV and over). Moreover, because of several cables, such as oil-filled cable and rubber cable, they need to be added specification requirements in the standard.

- Needing to be added the content for Testing lead-in porcelain insulator and utility system, such as cooling system, protection system in the part for testing 110kV and over transformer.

- Standard for measuring dielectric absorption  $\text{tg}\delta\%$  need to be changed.

\* Mr. Ken & Mr. AKi (Yonden Company): They presented general policies, the purpose of compiling revised regulation (Vol.6 and Vol.7). These volumes also are be added in some articles that moved from Vol.1 up to Vol.4 and totally new articles. Basically, the regulation does not change much because in 2007 the same group of Japanese JICA Vietnam has changed, but the comments to the regulations will also be considered if appropriate editing.

\* Mr. Ken (Yonden Company): He presented general policies, the purpose of compiling a new regulation and showed the differences between the existing and revising regulation. He also presented the revised content of Volume 3.

\* Mr. AKi (Yonden Company): He presented the revised content of Volume 4, especially the revised content for earthing grounding.

\* Mr. Masuda (Yonden Company): He presented the revised content of Volume 2

\* Other opinion from Representative of HoChiMinh Power Company:

- It is necessary to consider the feasibility of applying the new regulation.

- To earthing grounding, page 78: There is only formula to calculate the insulated neutral earthing resistor, not for direct neutral earthing resistor.

- To article I.3.43 (II.3.79), installing underground cable, to 22kV and under cable, the depth of

burying is 0.7m. This is conflict with the requirement for installing 0.4kV cable on the ground/pavement. They suggested the depth of burying is from 0.4m to 0.7m when installing the 0.4kV.

- To article I.3.44 (II.3.80): If it should be added specification requirement for low voltage cable.
  - To I.3.43 (II.3.79): It is necessary to consider the formula to calculate the earth resistance because a given formula is just coherent when applying for calculating insulated neutral earthing resistor, not for the effective neutral earth resistor.
  - Group of expert concerned admit all opinion and advise representatives of units to send their ideas directly to MOIT via email.
- \* Mr. Ken (Yonden Company): He showed in details the orientation work, such as giving a new name for the new regulation.
- \* Mr. Dung (MOIT) thanks for representatives of units and welcome for all contributing idea for new regulation.

Concluded

## 2. Draft Minutes of 1st Workshop at Hanoi (Network) (March. 14, 2010)

|  |  |
|--|--|
| Date:  | 14 <sup>th</sup> March 2010 10.40 AM to 16.30 PM,  |
| Venue  | Melia Hotel Conference room  |
| Vietnamese Counterparts  | + Mr Dang Hai Dung: Vice Manager of Department of Science and Technology – Ministry of Industry and Trade<br>+ Mr Tran Huu Ha – Deputy Director General – Department of Science and Technology – Ministry of Construction;<br>+ MOIT: Mrs. Hau<br>+ EVN: Mr. Khiem; Mrs. Lan Binh<br>+Sub-consultant group – Mr. Tuan and Linh ETC1. |
| JICA member  | Mr. Kuwahara, Mr. Aki, Mr. Yamada, Mr. Masuda,   |
| <p>Agenda of Workshop of Network</p> <p>Background of revision on Technical Regulations Vol.1 to Vol.7 under MOIT</p> <p>Proposed major revisions on the existing QCVN Vol.1 to Vol.4</p> <p>Proposed major revisions on the existing QCVN Vol.5</p> <p>Proposed major revisions on the existing QCVN Vol.6</p> <p>Proposed major revisions on the existing QCVN Vol.7</p>   |  |
| <p>The comments in the workshop session:</p> <p>Main Discussion</p> <ul style="list-style-type: none"> <li>✓ Mr. Dung (MOIT)</li> </ul> <p>He presented the purpose and requirements of the revised regulation, as well as development standards consistent with the new regulations promulgated by the National Assembly. He simultaneously highlighted the goal for this conference that was to collect the opinions of all units, based on which JICA will receive a complete editing to prepare the final draft, then proceed to completed the first phase of the project in July 2011</p> <ul style="list-style-type: none"> <li>✓ JICA</li> </ul> <p>JICA presented general policies, the purpose of compiling a new regulation. He also provided normative comparisons Vietnamese with Japanese and some international standards. And JICA also presented general policies, the purpose of compiling revised regulation (Vol.5). The regulation does not change much because in 2007 the same group of Japanese JICA Vietnam has changed, but the comments to the regulations will also be considered if appropriate editing.</p> <ul style="list-style-type: none"> <li>✓ Comment from Vietnamese side: Insulating oil is used extensively in electrical equipment. So that it is better to add a new item in the revised regulation in order to show out a new oil standards and operating oil. For example: Table 27-6 (page 5-13)</li> <li>✓ Comment from Vietnamese side: Technical Regulation referring to testing transformer oil, given value of gas content in oil is incoherent and needed to be changed, for example, increase the value.</li> <li>✓ Comment from Vietnamese side: Testing voltage for underground cable, referring to Annex,</li> </ul> |  |

Table 1-1 (page 5-97), given value is incoherent and needed to be changed to gain conforming to standards.

- ✓ Comment from Vietnamese side: Table referring the distance insulator air data is classified into 2 items, kV and air gap in mm. If it is needed to rewrite in the clear way and classify into only 1 item, kV or air gap in mm.
- ✓ JICA presented Part 3 including table III.2.1 (III.2.53) referring the minimum distance to ensure safety for indoor and outdoor equipment.
- ✓ Mr. Dung (MOIT) thanks for representatives of units and welcome for all contributing idea for new regulation.

Concluded

### 3. Draft Minutes of 2nd Workshop at HCMC (Network) (June. 22, 2011)

|   |   |
|---|---|
| Date:   | 22 <sup>nd</sup> June 2011 8:30~17:00   |
| Participant   | MOIT Mr.Dung<br>EVN(Vietnam Electricity) Ms. Binh<br>ETC(Electrical Testing Center) Mr. Khiem, Mr. Tuan, Mr.Linh,<br>Others |
| Venue   | Caravelle Hotel   |
| JICA Team   | KEN, Yamada, Aki, Masuda  |
| Contents: 2 <sup>nd</sup> Work Shop in HCMC   |   |
| <p>Discussion Contents :</p> <ul style="list-style-type: none"> <li>- JICA Network Team explained WS report (power point files) about revised Technical Regulation. Participates in 2<sup>nd</sup> WS generally agreed with its revision.</li> </ul> <p>Main topics of the discussion as follows,.</p> <ul style="list-style-type: none"> <li>- Regarding the question about hydro power regulation, JICA explained that civil works of hydro does not included MOIT work and the participant understood it.</li> <li>- The comments that it is difficult to understand the scope of bare conductor. JICA explained that bare conductor is applied to Overhead line(articleI.1.8) and both side agreed this comments.</li> <li>- Regarding the comments the descriptions of electrical power line duplicate voltage up to 1kV and up to 35kV in article I.1.6. JICA agreed the opinion and will revise it without the duplication.</li> <li>- The opinion which withstand voltage and test duration in the regulation Vol.5 are not matched actual situation in Vietnam. And JICA explained the detail technical concept about it.</li> </ul> <p>According to the comment in 8th WG on 13<sup>th</sup>, May 2011, Vietnamese members requested JICA to collect the opinion from HCMC and Nha Trang during 2nd WS.</p> <p>Withstand voltage test in Vol.5 revised by previous JICA study in 2007 therefore the test methods complied by Technical Regulation in Japan. JICA discussed it with participates and found that Vietnamese engineers inspects withstand voltage test only voltage up to 35kV by method IEC decided.</p> <p>So, JICA and Vietnamese side agreed with these revisions to sift Appendix I to Guideline and will continue to discuss for withstand voltage and its test duration.</p> <ul style="list-style-type: none"> <li>- JICA agreed to delete Fault Locating Equipment in Article I.2.96, because Fault Locating Equipment is not used actually in Vietnam. (Final decision will discuss in Hanoi.)</li> <li>- JICA decided that Withstand Voltage and Minimum Clearance in Part 4 sift to Guideline.</li> </ul> <p>JICA continue to consider with concrete value of voltage and distance until Guideline discussion.</p> |   |
| Concluded   |   |

#### 4. Draft Minutes of 2nd Workshop at Nha Trang (Network) (June. 24, 2011)

|   |   |
|---|---|
| Date:   | 24 <sup>th</sup> , June, 2011 8:30~17:00  |
| Participants  | MOIT Mr.Dung<br>EVN(Vietnam Electricity) Ms. Binh<br>ETC(Electrical Testing Center) Mr. Khiem, Mr. Tuan, Mr.Linh,<br>PECC4 Mr.Hai, CPC3 Mr.Nhan |
| Venue:  | Sunrise Hotel Conference room   |
| JICA Team   | Kuwahara, Yamada, Aki, Masuda   |
| Contents: 2 <sup>nd</sup> Work Shop in Nha Trang  |   |
| <p>Discussion Contents :</p> <p>-- JICA Team explained revised Technical Regulation and the Vietnamese participants generally accepted about these revisions.</p> <p>-- As there are no differences the value of air clearance between both countries, Both side agreed NOT to change the criteria values. Also JICA replied there are no need to special measurements for air clearance against the different temperature.</p> <p>-- In regard to the comments about BIL(Basic impulse Insulation Level), it is effective or not to adopt Japanese data instead of IEC data. JICA explained carefully from the technical view point.</p> <p>-- For the concrete measurement against lightning surge, JICA suggested to manage insulation coordination utilizing lightning arrester and Vietnamese side agreed with these comments.</p> <p>-- Regarding withstanding voltage test, the conclusion of the discussion is to describe the concept that “mandatory to conduct withstanding voltage test” in technical regulation. The detail value of withstand voltage are studied and described in Guideline.</p> <p>-- There are request from Vietnamese side to JICA Team to conduct additional survey for appropriate test voltage and duration time in each facilities. JICA Team accepted this request to study IEC standard and will send the results to Vietnamese side until next visit.(October)</p> <p>&lt;&lt;After the discussion in Hanoi WS, this request were withdrew (canceled). Because Vietnamese side agreed to use existing appendix 1 for withstand voltage test &gt;&gt;</p> <p>-- JICA recommended that it is very effective to refer the data of factory inspection instead of site test, when there are not specific testing value in IEC, &lt;&lt;After the discussion in Hanoi WS, this request were withdrew (canceled). Because Vietnamese side agreed to use existing appendix 1 for withstand voltage test &gt;&gt;</p> |   |

-- Regarding the cable testing article, both side agreed to delete the sentences about the special case to omit the test.

Concluded

## 5. Draft Minutes of 2nd Workshop at Hanoi (Network) (June. 28, 2011)

|  |   |
|--|---|
| Date:  | 28 <sup>th</sup> , June 2011 8:30~17:00   |
| Participants   | MOIT Mr. Dung<br>EVN(Vietnam Electricity) Ms. Binh, Mr. Khiem and others<br>ETC(Electrical Testing Center) Mr. Tuan, Mr. Linh,<br>Others 13th persons |
| Venue  | Melia Hanoi Hotel   |
| JICA Team  | Kuwahara, Yamada, Aki, Masuda,  |
| Contents of 2 <sup>nd</sup> Work Shop in Hanoi   |   |
| <p>-- There are requests to add upper limit voltage “35kV” in the definition of Extension electrical power line, JICA agreed with them.</p> <p>-- There were opinions that “There are no fault locaters in almost all transmission lines in Southern area.” in HCMC. Therefore JICA team confirmed the actual situation in Northern area.<br/>At the result of the discussion, both side agreed that transmission line greater than or equal to 220kV shall install fault locater and reflects it in Technical Regulation.<br/>Additional revision is to describe as a special case that installation of fault locater in the important transmission line less than or equal to 110kV are desirable, and it is reflected in Guideline.</p> <p>-- The request to change the scope of application of suspended insulator accepted by both side.</p> <p>-- The request to change the definition of transmission SS and distribution SS accepted by both side and JICA will change the content of technical regulation according to Circular32 and Circular12. Vietnamese side will provide JICA these circular s later.</p> <p>-- The request to change the title name “Distribution facility” to ” Distribution equipment”. JICA approve to change it.</p> <p>-- Area classification such as Urban area, Rural area and Polluted environmental area should be described in definition. JICA approve to describe their basic definitions, but detailed explanation should be described in Guideline. And JICA suggested Vietnamese side that it is difficult to define these areas using specific index.</p> <p>-- JICA explained the measurements and purpose to introduce both Air clearance and withstand voltage to secure the insulation level. And Vietnamese side understood them.<br/>JICA received the question about the management of minimum air clearance in cubicle, JICA explained that If these equipment satisfied withstand voltage test such as lightning surge, there are</p> |   |



no need to keep air clearance criteria.

-- There are requests to add the inspection of the conductors connections to Vol.5 article13(2-9).  
JICA agreed with them and will describe clear explanation in it.

-- Regarding withstand voltage test, it is mandatory to do in the technical regulation. The result of discussion is Vietnamese side prefer existing Vol. 5 appendix 1 but this appendix will be shifted to the guideline. (Vietnamese side understood that following all the test to IEC standard are very difficult)

-- Regarding the request to introduce the measurement of the current of No-load transformer, JICA did not suggested to adopt it because of the difficulties of the test. But after the strong request by Vietnamese side, JICA accepted them and will discuss the test methods in Guideline development stage.

-- Vietnamese side agreed with other JICA reply to their comments.

Concluded

## 6. Draft Minutes of 3rd Workshop at Hanoi (Network) (October. 26, 2012)

|  |  |
|--|--|
| Date:  | 26 <sup>th</sup> October 2012 from 10:00 to 16:20                |
| Venue  | Caravelle Hotel Conference room                                  |
| JICA member  | JICA Network Team Mr. Kuwahara, Mr. Aki, Mr. Yamada, Mr. Masuda, |
| <p>Agenda of Workshop of Network</p> <ul style="list-style-type: none"><li>- Explanation of framework for Technical Regulation and Guideline (JICA)</li><li>- Confirmation of work schedule and task allocation among JICA and organizations concerned in Vietnam for development of Guideline (JICA)</li><li>- Discussion on the revision of the final draft of Technical Regulation Vol.1. (VN Consultant)</li><li>- Discussion on the comments and contents on the draft of Guideline Vol.1, 3, 4 and 5 (JICA)</li></ul>  |  |
| <p><u>[Opening remarks]</u></p> <p>* Mr. Nguyễn Duy Hoà ( MOIT):</p> <p>Speaking at the workshop, Mr. Hoa said that the purpose of the workshop III is to collect the opinions of all the units in and outside of EVN for Guideline Drafts and based on them JICA will conduct a complete editing to prepare for the final draft of the project before publication. Besides, Mr. Hoa introduced Mr. Cao Chan's presentation about some important modification during finalization of the regulation.</p> <p><u>[Explanation of work schedule]</u></p> <ul style="list-style-type: none"><li>- JICA and Workshop participants confirmed work schedule and the participants agreed to submit comments to MOIT Mr. Cuong by e-mail by 30<sup>th</sup> November 2012.</li><li>- Workshop participants agreed to submit comments which show specific opinions or numerical criteria, and also agreed to describe comments in English, if possible.</li></ul> <p><u>[Discussion on the revision of the final draft of Technical Regulation Vol.1]</u></p> <p>Mr. Cao Chan's presentation seven revisions</p> <ol style="list-style-type: none"><li>1. Area classification:</li><li>2. Oil supplying system for oil cables:</li><li>3. Distances to car road</li><li>4. Installation of different voltage level Overhead Lines on the same pole</li><li>5. Overhead lines that traverse or cross with water surface.</li><li>6. Cross the suspended cable lines and pipelines</li><li>7. Fire Protection</li></ol> <ul style="list-style-type: none"><li>- Workshop participants commented that the definition of “Area classification” doesn’t define the classifications properly (sub-clause 22 in article I.1.1). This definition shall be considered and modified by VN Consultant after discussion at Workshop in Hanoi on 30<sup>th</sup> November 2012.</li></ul> |  |

- Workshop participants commented that the articles on distance between overhead power lines with different voltages installed on the same pole don't mention the requirements on this issue clearly and properly. These articles shall be considered and modified by VN Consultant after discussion at Workshop in Hanoi on 30<sup>th</sup> November 2012.
- JICA and Workshop participants agreed that the communication line installed on the pole with power line should be revised from 1kV to 35kV. (Article I.3.)

[Discussion of the comments and contents on the draft of Guideline Vol.1, 3, 4 and 5]

- JICA and Workshop participants agreed that requirement on ground resistance of a pole with the length exceeding 40m and that on installation method for grounding conductor for a pole are added in article I.6.9.
- JICA and Workshop participants agreed that the article on measuring method of ground resistance should not be included in Guideline. It shall refer in manufacture manual.
- JICA and Workshop participants agreed to the article on alarm setting on oil level in conservator of a transformer proposed by JICA in Guideline. (1<sup>st</sup> level: alarm, 2<sup>nd</sup> level: trip)

Concluded

## 7. Draft Minutes of 3rd Workshop at Hanoi (Network) (October. 30, 2012)

|   |  |
|---|--|
| Date:   | 30 <sup>th</sup> October 2012 from 8:30 to 16:50                 |
| Venue   | Melia Hotel Conference room                                      |
| JICA member   | JICA Network Team Mr. Kuwahara, Mr. Aki, Mr. Yamada, Mr. Masuda, |
| <p>Agenda of Workshop of Network</p> <ul style="list-style-type: none"> <li>- Explanation of framework for Technical Regulation and Guideline (JICA)</li> <li>- Confirmation of work schedule and task allocation among JICA and organizations concerned in Vietnam for development of Guideline (JICA)</li> <li>- Discussion on the revision of the final draft of Technical Regulation Vol.1. (VN Consultant)</li> <li>- Discussion on the comments and contents on the draft of Guideline Vol.1, 3, 4 and 5 (JICA)</li> </ul>  |  |
| <p><u>[Opening remarks]</u></p> <p>* Mr. Nguyễn Duy Hoà ( MOIT):</p> <p>Mr. Hoa said that the purpose of the workshop III is to collect the opinions of all the units in and outside of EVN for Guideline Drafts and base on them. JICA will conduct a complete editing to prepare for the final draft of the project before publication.</p> <p>Besides, Mr. Hoa introduced Mr. Cao Chan's presentation about some important modification during finalization of the regulation.</p>   |  |
| <p><u>[Explanation of framework and Confirmation of work schedule and task allocation]</u></p> <ul style="list-style-type: none"> <li>- JICA and Workshop participants confirmed work schedule and the participants agreed to submit comments to MOIT Mr. Cuong by e-mail by 30<sup>th</sup> November 2012.</li> <li>- Workshop participants agreed to submit comments which show specific opinions or numerical criteria.</li> </ul>   |  |
| <p><u>[Discussion on the revision of the final draft of Technical Regulation Vol.1]</u></p> <p>Mr. Cao Chan's presentation seven revisions</p> <ol style="list-style-type: none"> <li>1. Area classification:</li> <li>2. Oil supplying system for oil cables:</li> <li>3. Distances to car road</li> <li>4. Installation of different voltage level Overhead Lines on the same pole</li> <li>5. Overhead lines that traverse or cross with water surface.</li> <li>6. Cross the suspended cable lines and pipelines</li> <li>7. Fire Protection</li> </ol> <ul style="list-style-type: none"> <li>- Workshop participants commented that the modified definition of “Area classification” (sub-clause 22 in article I.1.1) proposed by VN Consultant cannot be acceptable from the viewpoint of conformity with existing regulations and that JICA’s final draft should not be modified because it was made according to the agreement at the WG discussion held on 2<sup>nd</sup> to</li> </ul> |  |

6<sup>th</sup> July 2012. This issue shall be considered according to comments on Workshops in HCMC and Hanoi.

- Workshop participants commented that the regulation on distance between overhead line and water surface should be revised according to existing Decree, etc. (article I.3.115)
- VN Consultant shall revise the final draft of Technical Regulation Vol.1 in consideration of the opinions from Workshop participants as well as comments on Workshop which have to be sent by 30<sup>th</sup> November. VN Consultant shall be also responsible for additional discussion on the revisions to get approval of the revisions from MOIT or other related organizations.

[Discussion of the comments and contents on the draft of Guideline Vol.1, 3, 4 and 5]

- JICA and Workshop participants agreed that the figure shown at the article 248 in Guideline Vol.3 should be modified in order to make it understood more easily.
- As for the request for supplementary contents on calculation of ground resistance, JICA required any actual design documents on grounding system at substations. This issue will be considered at WG scheduled for the next JICA mission.

Concluded

## **Appendix-6**

### **Minutes of Meeting with Stakeholders**

- |   |                    |
|---|--------------------|
| <b>1. Minutes of meeting with Electricity Vietnam</b>         | <b>24/Aug/2012</b> |
| <b>2. Minutes of meeting with Electricity Vietnam</b>         | <b>28/Aug/2012</b> |
| <b>3. Minutes of meeting with Vietnam Thermal Association</b> | <b>28/Aug/2012</b> |
| <b>4. Minutes of meeting with PV-Power</b>                    | <b>29/Aug/2012</b> |
| <b>5. Minutes of meeting with Vinacomin-Power</b>             | <b>29/Aug/2012</b> |
| <b>6. Minutes of meeting with Institute of Energy</b>         | <b>30/Aug/2012</b> |
| <b>7. Minutes of meeting with Electric Vietnam</b>            | <b>31/Aug/2012</b> |

## 1. Minutes of Meeting with Electricity Vietnam

|   |      |  |
|---|------|--|
| Date and Time:  |      | 24/Aug/2012 8 : 50~11 : 10                                 |
| Vietnamese Counterpart:   |      | EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:  |      | 204 meeting room (2F) at MOIT                              |
| Participants:   | MOIT | —  |
|   | EVN  | Mr. Viet, Mr. Thong, Ms. Hien                              |
|   | ETC1 | Mr. Truong   |
|   | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu    |
| Contents  |      |  |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) We would explain again about positioning and role of technical regulations and guidelines in about an hour based on the PPT "How to Use Guideline for Thermal Power Facility",</p> <p>(2) We returned the opinion of JICA against EVN comments for Vol.2. We would like to discuss them and report the results to the WG. (The comment list from MOIT will be organized in WG without discussion in this meeting. It cannot be understand whether comment list from EVN and MOIT are merged or not. It may be no merge from the contents. I provided the comment list )</p> <p>(3) If there were other opinions to be discussed, we want to discuss them.</p> <p>(4) Distributed materials</p> <p>1) How to Use Guideline for Thermal Power Plant (English version)</p> <p>2) Comment table for Vol.2 from EVN (English version)</p> <p>3) Comment table from MOIT (Vietnamese version)</p> <p>2. Contents of meeting</p> <p>(1) About the positioning and role of technical regulations and guidelines</p> <p>1) It seems that the mandatory matters were written in Old Norm formerly. It seems to be under construction of new thermal power plants in the future. If a new power generation system that is applied the new technology will spread, technical regulations will not be able to follow the advance of technology. In the United States, Europe and Japan, the system has been changed to prescribe only the minimum requirements on safety in the technical regulations. The minimum requirements on safety are such as "the safety valve must be installed on the drum or pressure vessel". (Mr. Koga)</p> <p>2) For operation, maintenance, and inspection, you have defined as making a secure</p> |      |  |

operation and management by establishing the administration manual for each power plant in the technical regulations in the law system of Vietnam. If you want to develop its administration manual, it will be able to see international standards and guidelines, TCVN, O&M manual, Old Norms and the guidelines provided by JICA. (Mr. Koga)

- 3) Technical regulations require operating and maintaining by administration manuals established in each power plant. In addition, this requirement has been prescribed in existing regulations and the one under development as well. (Mr. Koga)
- 4) Guidelines are not intended to set forth all paragraph same as mandatory standard. It is better to understand as reference book to snatch food for the formulation of administration manual. (Mr. Koga)
- 5) If so, the guidelines will be the extremely rough. (Mr. Viet )
- 6) The contents are naturally shifted through, since the paper is limited. (Mr. Koga)
- 7) The regulation must be prescribed with detail, since it must be complied with. Therefore, we want to incorporate the provision of Old Norm into the new regulations. (Mr. Viet)
- 8) We will never incorporate the provision of Old Norm into the new technical regulations. However, we have been saying that you do not mind that you referred Old Norm depending on the circumstances of the power plant when creating the administration manual. (Mr. Koga)
- 9) If so, the administration manuals or that there is only the number of power plants. (Mr. Viet)
- 10) That is right. There are a number of administration manuals corresponding to the number of power plant. The actual contents will vary for each power plant in every new plant, old plant and the plant which has a lot of troubles. (Mr. Koga)
- 11) Owner may select what to do additionally as long as the minimum requirements on safety were satisfied. (Mr. Koga)
- 12) I ask to provide mandatory matters to surely observe in the regulations. As well as minimum requirements on safety. I ask to provide the lowest and highest requirements and the conditions how to achieve it in the regulations. (Mr. Viet)
- 13) Using the example in the car, it is the minimum requirements on safety to equip a direction indicator, steering equipment and stop device, the requirements to achieve the speed of 300km / h to have a turbo charger, to have the leather seats or to equip a car navigation is a matter of voluntary choice to decide consulting with the budget and preference of buyer. (Mr. Koga)
- 14) If so, is the cheap cars made in China and made in Cambodia also real car? (Mr. Viet)
- 15) Rolls-Royce made in the United Kingdom and the cheap car of Tata made in India



is either car, even if they meet minimum requirements on safety. The car which has not stop device is not a car. (Mr. Koga)

- 16) If so, I want JICA considering establishing those which conforming to the laws of Vietnam, since we are establishing a Vietnamese regulations. We are not interested in the laws and regulations of Japan. (Mr. Viet)
- 17) We are not necessarily trying to push. We have proposed the one which is appropriate for Vietnam, taking into account with global trends and the requirement of Vietnamese *Standards Law*. However, we have suggested only recommendation, since we are not in a position to formulate your laws and regulations. It must be decided eventually by Vietnam side what to do. (Mr. Koga)
- 18) Even though you advice us, we do not know what shall we do if you do not create a regulation that is suitable for Vietnam. (Mr. Viet)
- 19) Since Mr. Thong talked about the basis of the enforcement to requirement to establish administration manuals yesterday, we have explained again today. (Mr. Koga)
- 20) The regulation is the top law in Vietnam, (Mr. Viet)
- 21) We feel that the legal system is slightly different between Vietnam and Japan. If Vietnam side regard that it is necessary, it would be better to put in, though further details of administration manuals that we are not going to provide in the technical regulations at this moment.. We think it should be specified in higher position of the legal system because it's more important. (Mr. Koga)
- 22) If you cannot put it into Law and Degree, putting in the technical regulations is not bad. It is not bad to provide what should be prepared in the administration manual in a bulleted list in order to have a common understanding in each power plant, although it is rough, we proposed the necessary content. (Mr. Koga)

(2) Comments for Vol.2 guideline

1) General

- Although general comment has come out, it is impossible to understand what they are ask to modify specifically. On the contrary, individual comments are concrete. (Mr. Koga)
- Today, we will not discuss about this. (Mr. Viet)

2) ST-item 3: "Reheat"

- This is a comment that "Reheat" of steam turbine type is to be corrected to "Regenerative and reheat". Regenerative and reheat type is the combination type of essential type and is not a particular basic model. (Mr. Koga)
- It is no need to change. (Mr. Viet)

- 3) ST-item 10: “Persons type”
  - “Reaction turbine” is called “Parsons Turbine” with the inventor’s name. It is same in the boiler, to call “Benson Boiler”. (Mr. Koga)
  - In Vietnam, it is not called “Parsons Turbine”. (Mr. Thong)
  - Bbecause either it is not a mistake; I change it to "Reaction turbine". (Mr. Koga)
  
- 4) ST-item 11, 12 and BLR-item 3: “30.1MPa(g)”
  - The comment is supercritical pressure must be "24.1MPa (g)" instead of “30.1MPa (g)”. But, there is only one case as a commercial plant. I have introduced it. In the future, “35MPa (g)” will come out. (Mr. Koga)
  - Where is this plant? (Mr. Thong)
  - It is Kawagoe U-1 of Chubu Electric Co. Japan which is made by Hitachi, (Mr. Koga)
  - Why steam temperature is 600 ° C was not applied in case of the pressure is "31MPa (g)"? (Mr. Thong)
  - It is compatible by means of the thickness of the pipe or tube, but it was not possible corresponding steam temperature 600 °C at that time, since such material has not been developed. (Mr. Koga)
  - It is no need to change. (Mr. Viet)
  
- 5) ST-item 13: “Definition of pressure part”
  - It seems perhaps too strict about definition of "The pressure part is part under pressure over 0MPa". But, there is no comment what it should be. (Mr. Koga)
  - The regulation for pressure vessel prescribes the specific pressure. How do you think to provide supplementary provisions of "residual pressure"? (Mr. Viet)
  - We call “pressure part” anywhere is actually under pressure in the process of increasing, holding and decreasing pressure. What to do individually it is a different story,. (Mr. Koga)
  - What is the status of the pressure in the turbine? (Mr. Viet)
  - The pressure is 24MPa at the turbine inlet, is close to 0MPa at the turbine outlet. (Mr. Koga)
  - If we have a chance, Ms. Hien should make sure what questioner is saying. (Mr. Viet)
  
- 6) GT-item 1: Further explanation of “External combustion gas turbine”
  - There is the external combustion gas turbine which exchanges heat through a heat exchange using helium gas and nitrogen gas as the medium of closed cycle

and using the exhaust gas of the combustor placed apart from the body. Though there are not many cases as a principle, the external combustion gas turbine exists as being against internal one. (Mr. Koga)

- It is no need to change. In WS, it may be necessary to provide for explanation when you were asked. (Mr. Viet)

7) GT-item 6: “Compression ratio”

- It is the comment "compression ratio for class 1,100, 1,300, 1,500, and 1,600° C, should be less than 30". I would reconfirm. (Mr. Koga)
- It is confirmed later that July edition is “compression ratio for class 1,100, 1,300, 1,500, and 1,600° C is less than 30”. (Mr. Koga)

(3) Other matters

- 1) Whole book of Vol.2 may has been read, is it all the comment? Although it is less a matter of joy, we come suddenly in trouble later. (Mr. Koga)
- 2) Latest comment has not been reflected. We have sent the comment table Ver. August to Mr. Cuong of MOIT. (Mr. Viet)
- 3) We have not been received it. We are no care that Ms. Hien sends to us Word version by e-mail in advance. (Mr. Koga)
- 4) I want to review the classification of the temperature of gas turbine. I ask to supplement 1,200 ° C class. (Mr. Thong)
- 5) As explained before, it is for the convenience of designation. It is no sense to put an end if you want to change increments 100° C to 50° C. There is no relation between the gas temperature and the output. The technical requirements will differ depending on the gas temperature. (Mr. Koga)
- 6) 1,250° C is called 1,300° C as rounded. (Mr. Higo)
- 7) It may suggestion, how do you to remove the summary section of the reference standard list to only the standard with number and title? We want to reduce the amount of useless pages. Unnecessary work will occur to translate the word “Vietnamese ⇒ English ⇒ Vietnamese”, though there is comment that “Vietnamese section of TCVN must be translated into English”. Basically, the international standard must be purchased and referred to pay by power plant Owner. The Owner of power plant should purchase and refer it. (Mr. Koga)
- 8) TCVN should have provided by MOIT. (Mr. Viet)
- 9) We have not got from MOIT. Therefore, we have selected and presented by means of searching the database of STAMEQ. (Mr. Koga)
- 10) English may not be translated; we want to leave a summary as it is. However, we also want ask to make an English version. (Mr. Thong, Mr. Viet)

EOD

## 2. Minutes of meeting with Electricity Vietnam

|   |      |  |
|---|------|--|
| Date and Time:  |      | 28/Aug/2012 8:30~11:00                                     |
| Vietnamese Counterpart:   |      | EVN (Electricity Vietnam)<br>ETC (Electric Testing Center) |
| Venue:  |      | 205 Meeting room (2F) at MOIT                              |
| Participants:   | MOIT | —  |
|   | EVN  | Mr. Viet, Mr. Thong, Ms. Hien                              |
|   | ETC1 | Mr. Truong   |
|   | JICA | Mr. Koga , Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu   |
| Contents  |      |  |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) Exchange of opinions for comment about Vol.4&amp;5 mechanical for Ver.3 from MOIT</p> <p>(2) Distributed material</p> <p>    1) Comment table Ver.3 from MOIT</p> <p>2. Contents of meeting</p> <p>(1) Comments for Vol.5</p> <p>    1) I want the technical regulation to be more detailed one. (Mr. Thong)</p> <p>    2) Originally, the mandatory matter of technical regulation is to confirm the soundness. The stipulation to perform major inspection once in six years all the way, though it is the selection as voluntary matter. (Mr. Koga)</p> <p>    3) What should we measure? There is no manual in new power plants and old power plant in Vietnam. (Mr. Thong)</p> <p>    4) If there were no in the new power plant, it must be the problem how to purchase. It is necessary to ask to deliver the manual the inspection items and judgment criteria in the O&amp;M manual. It is necessary to get the concrete specific judgment criteria from manufacturer. (Mr. Koga)</p> <p>    5) I would present a reference material regarding inspection items for periodic inspection. (Mr. Thong)</p> <p>    6) Although it is written that the alignment must be confirmed as the test item in the list provided by Mr. Thong, in fact, it is not useful without numbers from the manufacturer. Currently, there are the only plants with only one coupling. But, large turbine has six rotors, and it is also necessary to offset. (Mr. Koga)</p> <p>    7) You may provide simply what should be done. (Mr. Thong)</p> <p>    8) It is no problem to provide that "the alignment to be verified" as an item to be</p> |      |  |

checked in the regulations. (Mr. Koga)

(2) Comments for Vol.4

1) Item-1: Relationship between technical regulations and guidelines

- It is the reverse to correct the technical regulations based on the guidelines. (Mr. Higo)
- It is a comment that there is no stipulation in the regulation corresponding to guideline. It is a comment that something in the guidelines should be mentioned in the regulations. (Mr. Viet)
- We would discuss with MOIT, since we do not know the place clearly where pointed out. (Mr. Koga)

2) Performance curve

- We do not prescribe the matters regarding performance curve, economic efficiency and management in the guidelines, because there are not related to safety. (Mr. Higo)

(3) Others

- 1) It has been found that we are requested not only those related to safety but something that contains administrative matters, management issues and economic issues are required during this mission. (Mr. Koga)
- 2) It should be discussed with MOIT, since they are comments from MOIT. (Mr. Viet)
- 3) Does efficiency contribute to the safety? (Mr. Thong)
- 4) Efficiency and safety is another thing. (Mr. Koga)
- 5) Also, isn't it important the safety of workers? (Mr. Thong)
- 6) We are now developing the regulation for the safety of the equipment. Health and safety of workers should be regulated by the regulation of the Department of Labor regulations. (Mr. Koga)
- 7) In Vietnam, there is no such regulation. (Mr. Thong)
- 8) Although the regulations which JICA is contributing are concentrated in the technology, we want to cover all elements to manage a power plant. (Mr. Thong)
- 9) We feel the difference between Vietnam and Japan as the result I heard. We feel that you request to regulate matters to be regulated by different laws. It is the selection of Owner Whether to purchase something efficient. (Mr. Koga)
- 10) Although there is regulation about the health and safety of workers in Vietnam, there is nothing about specific one for power plant. (Mr. Viet)
- 11) In order to ensure efficiency, it must be defined to use some level of equipment by regulation. (Mr. Viet)

- 12) I ask JICA to discuss with MOIT because there is no comment from EVN today.  
(Mr. Viet)
- 13) We are discussing how you feel for this kind of theme. (Mr. Koga)
- 14) There is no material, though meeting agenda for the meeting 31/Aug must be provided 14 days prior to the meeting. (Mr. Viet)
- 15) There is no material, since we have not received the comment from EVN, although it is necessary to read the guideline in advance. We want to discuss with electricity part because Mr. Egashira will come to this meeting. It is going to get comment on the spot. (Mr. Koga)
- 16) If there is no material, let's cancel the meeting on 31/Aug. (Mr. Viet)
- 17) We are trouble by such non-cooperative. Comments like Vol.2 list have not come from EVN. Let's discuss the past comments of Vol. 2&4&5 together, it may be in the morning. (Mr. Koga)
- 18) We will discuss on the spot in the morning then. (Mr. Viet)
- 19) Can I regard that we agreed to provide the lists for the requirements of administration manual in the regulations? (Mr. Thong)
- 20) We will provide the recommended items to put as matter of common. (Mr. Koga)
- 21) Regarding welding, the content stated in the Vol.2 and Vol.5 Article146-a8 is different. I cannot understand. (Mr. Thong)
- 22) There are a lot of welding standards. For Vol.2, we introduce an example of the Japanese Ministry of Economy, Trade and Industry. ASME is the most popular one in the world. It may be select ASME, API, ISO, JIS and the like. (Mr. Koga)
- 23) We never provide the welding procedure in the regulations. We only require performing sound welding. Owner should select the best method for it. (Mr. Koga)
- 24) There are the welding procedure test and the welder qualification test. These tests may be pursuant to the procedures set forth in various standards. (Mr. Koga)
- 25) There is no problem, if there is no discrepancy between both technically, since the guidelines are any reference book. You should snatch food. You can refer either. If you're confused, we may remove the items mentioned Vol.5. (Mr. Koga)
- 26) It is no need to remove, but there are also various mechanical tests. We cannot know how to apply when welding. It is necessary to carry out mechanical tests for each welding procedure, rather than mechanical test for field welds, I ask to put the items into Vol.5 "Owner should check in a specified manner according to the selected Procedure". (Mr. Thong)
- 27) Do the Vietnamese see the paper only; even the CD-ROM has been distributed?  
(Mr. Koga)
- 28) Vietnamese do not see mach because they are busy. (Mr. Hien)
- 29) I want JICA to write specifically so that the president of the power plant can

understand. (Mr. Thong)

30) It is not the easiness of understanding. There were some comments that it is necessary to reduce the contents of the reference list of welding. It is necessary to read each standard carefully in practice. (Mr. Koga)

EOD

### 3. Minutes of Meeting with Vietnam Thermal Association

|  |      |  |
|--|------|--|
| Date and Time:   |      | 28/Aug/2012 14:00~16:20  |
| Vietnamese Counterpart:  |      | VTA (Vietnam thermal association)  |
| Venue:   |      | Meeting room in VTA  |
| Participants:  | MOIT | Mr. Cuong  |
|  | VTA  | Mr. Nghia : president ( Former professor, Hanoi University of Technology)<br>Mr. Huong : vice president (During active duty, Secretary of Energy MOIT (Directorate General Energy now)<br>Mr. Mung : vice secretary general (OB of MOIT)<br>Mr. Hghien : Representative engineer |
|  | ETC1 | Mr. Truong   |
|  | JICA | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu  |
|  |      |  |
| Contents   |      |  |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) This time, we want to explain that there is the role and positioning of the technical regulations and guidelines which we are going to contribute.</p> <p>(2) We want to ask the general comment for a draft that have been distributed by MOIT and want to exchange opinions.</p> <p>2. Contents of meeting</p> <p>(1) About VTA (Mr. Nghia)</p> <p>1) VTA is an organization of one of the United Nations Association of Science and Technology of Vietnam, an organization that gives an opinion or a consultant and the experts, administrators and professors and the like belong to it. Thermal technology is a specialized field. VTA is an independent committee to conduct an investigation of thermal projects. (expert group which is commissioned to investigate by the MOIT, or the Advisory Committee) Top management of the association is the authority in its field.</p> <p>2) We have specialized in thermal technology and responsible for mainly 10 professional themes.</p> <p>3) At least 1,000 people (80% are active) of EVN, ETC, five consultants and the like belong to VTA.</p> <ul style="list-style-type: none"> <li>➤ Supply of thermal energy for industrial</li> <li>➤ Environmental issues</li> </ul> |      |  |



- Water treatment
- Examination of thermal power plants and nuclear power plants, etc.

(2) Exchange opinions on technical regulations and guidelines

- 1) We have read the materials which were distributed from MOIT in advance. (Mr. Nghia)
- 2) Explanation of the positioning of technical regulations and guidelines will be omitted. (Mr. Cuong)
- 3) Have you already been read the technical regulations and guidelines? (Mr. Koga)
- 4) Like this meeting is the third time, we also have received documents. (Mr. Nghia)
- 5) I ask establisher to explain the policy about 10 minutes, since there will be an intention of author which we do not know. (Mr. Nghia)
- 6) We requested to establish the new mandatory regulation and its implementation guideline from JICA. (Mr. Koga)
- 7) It should have been required to establish regulation and standard conforming to the global standard after joining to WTO in 2007. Old detailed mandatory standard has become unable to keep up with technological advances. Therefore, it has changed the manner which defines the only minimum requirements for the part related to security and safety. The performance requirement prescribes “must be produced by the appropriate material and construction” instead of “must be \*\*\*mm or material\*\*\*\*must be used”. The performance requirement must be achieved by himself and be decided how to carry out with reference to international standard, etc. (Mr. Koga)
- 8) It is requested separately for important matters such as the safety valve or over-speed trip device. The prevention of destruction due to pressure, the prevention of fire, the prevention of destruction due to over-speed and fail-safe is the requirement of the feature request on safety. (Mr. Koga)
- 9) I have been involved in over a lifetime in the development of regulation and TCVN for Vietnam. Moreover, I have established them as a member of the pressure vessel boiler committee and the LNG committee. I have also served a head of the investigation team that connects the region and the world. I gratitude for cooperation by JICA as a person in the position to formulate the regulation and standard. (Mr. Nghia)
- 10) I have gathered staffs of the power plants, consultant and experts, so have heard their opinions after receiving the three drafts from MOIT. (Mr. Nghia)
- 11) Although I have not read all so large amounts, I felt that the latest version has been improved from last times and the time before. We want to make a constructive comment. I ask to reflect to the regulation and the guideline, though you may have

- any opinion or answers for our comments. It is felt that the policy of Mr. Koga has changed from the time of the last WS compared with what I heard today. We want to make comments, though the policy of Mr. Koga may be different. (Mr. Nghia)
- 12) There is Standard Law on the development of technical regulations in Vietnam. Also, Vietnam is a member of ISO. Vietnamese regulations and standards must be according to the international ones. (Mr. Nghia)
  - 13) Though it is necessary to adjust the standard internationally, the regulations should be drawn up independently in each country. (Mr. Koga)
  - 14) Standard is voluntary. Regulations currently being created are mandatory, though some standard will be mandatory if it were associated with the regulation; Technical regulations have less volume compared with standards. Therefore, it is not necessary to put the standard into the regulation. (Mr. Nghia)
  - 15) That's right. (Mr. Koga)
  - 16) There are many standards in Vietnam, I evaluate that the reference standards have been introduced in a list of the guidelines. However, it is not still enough. A part of TCVN becomes mandatory one in technical regulation Vol.2. On the other hand, further enhancement of the reference is necessary at the same time. Are there any legal effects on the guidelines? (Mr. Nghia)
  - 17) There is no legal effect on the guidelines. However, an administration manual is forced to establish by the mandatory regulation. (Mr. Koga)
  - 18) I understand that. (Mr. Nghia)
  - 19) For the case that it cannot be understood only by the technical regulations, we explain in the guidelines and introduce the reference standard which should be referenced. (Mr. Koga)
  - 20) Personally, I feel that such way of creating regulations does not fit to the way of one in Vietnam. (Mr. Nghia)
  - 21) Originally, something like the guidelines is not necessary. The Owner of plant own should buy a standard in order to peruse and refer. (Mr. Koga)
  - 22) In Vietnam, if we cannot understand the regulation, we carefully read the standard. (Mr. Nghia)
  - 23) I think that there is no standard which can be referenced except for boiler. In Vietnam. I think there is no standard for recommended specifications in TCVN if you want to buy a gas turbine. It will be able to refer TCVNs if international standards were incorporated into TCVN. (Mr. Koga)
  - 24) It is impossible to read guidelines with 1,300 pages against the regulations with 100 pages. (Mr. Nghia)
  - 25) It is no need to refer everyday if it has been established once, though you have a long time to make the administration manual when purchasing and starting

- operation of power plant. (Mr. Koga)
- 26) It is desirable that standards is as thinner as possible. It is no need environment laws and regulations, though they are listed. Because TCVN is not mandatory, it is no need to list in the regulations. (Mr. Nghia)
  - 27) In the next version, they have been deleted depending on the request of MOIT as people of the power plant are familiar with the regulations, so as to conform to the laws and regulations of the Ministry of Environment. (Mr. Koga)
  - 28) I want you to leave it. (?) (Mr. Mung)
  - 29) As the needs of VTA, we want you to leave it. (Mr. Nghia)
  - 30) We ask to introduce how to achieve the request of regulation by means of reading standards again. I cannot understand from the text. (Mr. Nghia)
  - 31) It is impossible to peruse TCVN in Vietnamese for us. Originally, environment laws and regulations are not a regulation for the power facility; I provided them, since it would be unkind for people of power plant. It is the issue of scope of facilities for power generation which we are asked. We also worried about whether the facility which is regulated by other laws and regulations should be in the regulation of generation facility or not, since it is unclear. (Mr. Koga)
  - 32) It seems what is prescribed in the regulation is not in line with the method of Vietnamese to establish regulation. Classification of voltage is not conforming to Vietnam. (Mr. Nghia)
  - 33) It seems that the revised version that the classification of voltage has been updated to Vietnamese one has not distributed to president yet. (Mr. Koga)
  - 34) Currently, there is also an English version of the Vietnamese standards. I want you to get it from MOIT or read by obtaining directly. (Mr. Nghia)
  - 35) It is difficult to obtain the international standards including TCVN, since it must be purchased for a fee. (Mr. Koga)
  - 36) We also purchase them to confirm in Vietnam. (Mr. Nghia)
  - 37) Therefore, we introduce the title as a hint. (Mr. Koga)
  - 38) We would afford comments in writing later on, since we cannot issue all comments today. I want to JICA to judge how to treat them. (Mr. Nghia)
  - 39) We have created according to the range of request which we received from JICA, taking into account the opinions of the Vietnamese side. However, we do not want you to think that all comments can be reflected. Though we immediately corrected for technical matters, JICA evaluates the comments and judges what to do. Even if the comments are not reflected, it will be improved through the discussion. (Mr. Koga)
  - 40) I want to put the number of spare equipment and coal storage capacity in the regulations. (Mr. Nghia)

- 41) Although the regulation requires the minimum requirement on safety, further scope might be the scope of selection by Owner. (Mr. Koga)
- 42) It is important to specify the coal storage capacity in the technical regulation in the view point of the state administration. (Mr. Nghia)
- 43) We think that the number of auxiliary machine and coal storage capacity is the matter that Owner should consider margin as relating to contract and penalty. He should consider a matter in order to satisfy the BOT Contract or the Power Purchase Agreement. (Mr. Koga)
- 44) Management system in Vietnam is unlike with Japan. I understand that BOT is owed a responsibility to supply under the contract. (Mr. Huong)
- 45) Even the past was so; it does not necessarily change in future. (Mr. Koga)
- 46) Vietnam will not change. (Mr. Huong)
- 47) When the economy improves, it becomes easier to investment by overseas and it will be different from previous. It may not fit the punishment and penalty. In Vietnam. (Mr. Koga)
- 48) It is correct what you say, but now it is not. Penalty will not applied to EVN, PV-Power and Vinacomin but private power, since they are state company. It is a formality as there was. (Mr. Huong)
- 49) There is a BOT contract, but if investor has left using imported coal, the state must buy them. (Mr. Mung)
- 50) We create mandatory regulations in the view point on security and safety. Coal storage capacity is no relation with security and safety. (Mr. Koga)
- 51) The regulations should include the management requirements in addition to safety. (Mr. Nghia)
- 52) Such requirements related to management are not included in the range which has been asked from JICA. (Mr. Koga)
- 53) If only safety matter were stipulated in the regulation, it is impossible to be able to meet the regulation. Management is important. If only safe matter, it may be only standard. (Mr. Nghia)
- 54) I want to provide the diameter of the pipeline and the flow rate in the regulation. Investor would tend to use the pipe of small diameter. (Mr. Nghia)
- 55) It should not be prescribed in the technical regulation, since regulation is not how to design. It may conform to the reliable standard such as ASME B31 or others. (Mr. Koga)
- 56) It is necessary to provide concrete matter in the regulation, since the designer performs design according to the regulation. (Mr. Nghia)
- 57) It is not necessary to prescribe classification of the plant in the mandatory regulation. I do not know what has been decided on the basis of what criteria. How

is it used in somewhere? (Mr. Nghia)

58) You may use it if everyone recognizes, and you may delete if there is a problem, since they are not mandatory. Is there something wrong on the recommendation?

(Mr. Koga)

59) You have described the steam temperature, do you force conforming to it? It is forced matter when it is prescribed in the regulation. (Mr. Nghia)

60) Although not mandatory, such temperature and pressure are used implicitly in the Western countries. It is not crazy. (Mr. Koga)

61) Although we suggest, it may be mandatory not. If everyone regard useless, it may be deleted. It may be decided by Vietnam side. (Mr. Koga)

62) We will submit aggregated comments to MOIT at later on. (Mr. Nghia)

63) Listen to exchange opinions (Mr. Hghien)

- I want make it easier for Vietnamese to use, since the regulation is used by Vietnamese.
- That must be international one.
- Detailed numbers is not necessary, but I want to put Vietnamese standard in the regulation.
- I want to make the expression easier for Vietnamese to understand.

EOD

#### 4. Minutes of Meeting with PV-Power

|  |          |   |
|--|----------|---|
| Date and Time:   |          | 29/Aug/2012 8:30~11:00  |
| Vietnamese Counterpart:  |          | PV-Power  |
| Venue:   |          | TV Meeting room of PV-Power   |
| Participants:  | PV-Power | Mr. Thu (Member of Board of Directors)<br>Mr. Hung (Vice Director of Technical Division)<br>Mr. Binh (Officer of Technical Division)<br>Mr. Hung (Specialist of Technical Division)<br>Mr. Lung (Director of Design Center of consultant)<br>Mr. Thong (of Consultant)<br>(Ca Mau power station)<br>PV-Power Vice President<br>Mr. Ngha (PV-Power Service)<br>Mr. Luk (Vice President of PV-Power Service)<br>Mr. Tha (PV-Power Service)<br>(Nhon Trach power station)<br>Mr. Lock (President)<br>Mr. Luk (Plant manage)<br>Administrative manager<br>Vice general manager of engineering department (PV-Power Service) |
|  | MOIT     | Mr. Cuong   |
|  | ETC1     | Mr. Yen   |
|  | JICA     | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu   |
|  | Contents |   |
| <p>1. Today's agenda (Mr. Cuong)</p> <p>(1) We are performing the review and supplementation of technical regulations applied for the power plant facility with the assistance of JICA. This time, we would like to seek the opinion from PV-Power against policies of JICA for the establishment of technical regulations and guidelines related to thermal power plant facility.</p> <p>2. Contents of meeting</p> <p>(1) Explanation of the purpose of today's meeting and this PJ (Mr. Cuong)</p> <p>1) There was the Old Norms for each power plant, and it contributed the management of the country while intending to technical regulations.</p> <p>2) "<i>Standards Law No.68</i>" was promulgated in 2006 and notice is issued to each</p> |          |   |

ministry accordingly, therefore, it became to need to separate the regulations and standards along with it. Therefore, we are working to revise Old Norm to the new mandatory regulations in three areas with the cooperation of JICA. When these new technical regulations and guidelines were completed, they will be those which including the matters of the design, operation and management.

- 3) Technical standard is recommended to use.
- 4) Vietnamese engineers were familiar with what were written in detail in Old Norms. Vietnamese engineers may be confused with the new regulation, since there is no detailed requirement. Therefore, the guideline will be established too.
- 5) There is the difference between Vietnam and JICA due to the difference of progress of technology and correspondence and legal system, it has become an obstacle.
- 6) I hope to be the good one by means of getting comments, getting opinions, and reflecting. I arranged meeting with EVN, VTA and Vinacomin-Power, since it is necessary to complete drafts applicable in the generation field in Vietnam.

(2) Introduction of PV-Power business (Mr.Thu)

- 1) We welcome a visit of JICA today. The head office, Ca Mau power station and Nhon Trach power station will participate in this meeting.
- 2) PV-Power is a subsidiary of Petro Vietnam, and we have been the operation of the power plant. We are in charge the business of power generation and electricity work. PV manages Ca Mau 1 & 2 and Nhon Trach 1 power plant, and holds shares of two hydro electric power stations.
- 3) PV-PS is a maintenance service company and we have a project management consultant company and design Consultant Company.
- 4) Power plants that PV-Power has are as follows: Gas: Ca Mau 1 & 2 and Nhon Trach 1 & 2, Hydro: small + medium × 2, Coal: Bun Ann, Thai Binh, Ranfu and Kang Chuck, Wind: one small.
- 5) Today's meeting is going to be meaningful. Various international and domestic regulations are applied in the power generation field in Vietnam. The power generation companies have trouble what kind of regulation or standard must be applied and what kind of them are selective.
- 6) The regulations and standards unified in statewide are necessary, since Vietnam will glow economically in future. PJ which currently being proceeding would help to state management and technology management in the power sector.

(3) Explanation of the legal system pyramid (Mr. Koga)

- 1) Positioning and role of technical regulation, administration manual, EPC Contract, voluntary standard and guideline has been explained.

2) It is a new system based on the self- responsibility.

(4) Exchange opinions

- 1) I explain the differences of the opinions between MOIT and JICA. It has been agreed to some extent. (Mr. Cuong)
- 2) Have the pyramid of Vol.2&4&5 been agreed between MOIT and JICA? What is going on in Japan? (Mr.Thu)
- 3) This pyramid shows what the author intends to. We have not agreed completely, though nor have completely different opinions. If we are in line with the requirement to add detailed matters in the mandatory regulation, it will be differ from what we intend to. However, it has been changed now to the technical regulations prescribed performance requirement type in Japan completely in accordance with the global standards, though it was detailed mandatory regulation a long time ago. Old fine force matters has become equal to the matters shown is standard. Countries directly involved would be small. We recommend this style regulation, since this is the global trend and we leave selection to the Vietnamese side whether adopting or not. (Mr. Koga)
- 4) In the process of reading and translating a lot of foreign material, I was able to recognize that they give us the various choices. I could feel the open manner is the trend of the world, and I feel Vietnam should do so. I recognize extremely about content explained by JICA. (Person of the health and safety department)
- 5) We have predicted that there may be some people with such the opinion, since PV is young company which has many chances to contact often with foreign countries, It will be difficult to provide enforcement matters into mandatory regulation when technology advance rapidly. (Mr. Koga)
- 6) In each power plant, we are implementing the management and control while complying the law for maintenance of electrical equipment, planning and design of new PJ. (Mr. Hung)
- 7) The law of the new standard has directed to divide the regulation and the standards. The regulation is a force matter and it is not a minute detail. The guideline would be helpful for us. Pyramid figure is nearly same as the management system of PV-Power. (Mr. Hung)
- 8) In operation, we are implementing by mean of our administration manuals made based on the manufacture's O&M Manual. Among them, the operation procedure is included. Accident report has been carried out in accordance with Old Norms. Maintenance procedure has been incorporated according to the national regulation and international standards. Technical management procedure has been formulated according to the national regulation as well. (Mr. Hung)



- 9) It will be necessary guidelines, when we establish the rules of the entire management and maintenance. The guideline will be the guiding to achieve the requirement what technical regulation requires, now we are going to carry out the maintenance of Bun Ann power station. (Mr. Hung)
- 10) JICA documents are intended to help the future activities on the design management. When we design, we refer to Code (Regulation) & Standard. The purchase agreement is established based on the Vietnamese and foreign standards. If anything, we often use foreign standards. There is quite no difference between principle of JICA and actual activity that PV-Power is performing. (Mr. Hung)
- 11) There is no difference with the principle of JICA. We are adopting the international standards even when the contract EPC. We do not apply TCVN, though we refer to TCVN. Basically, manufacturer's O&M Manual is applied to the maintenance work. (Ca Mau power station)
- 12) That way is the just trend of the world, and also it is that way in Japan. (Mr. Koga)
- 13) We have illustrated sample of contents of the administration manuals (internal regulations of power station) in the PPT. (Mr. Koga)
- 14) The meaning of six year is that large scale inspection shall be carried out once within six years. It is important that Owner endeavor to reduce outage time by means of monitoring the power plant from the usual, decide the content and frequency of inspection himself and maintaining good condition. (Mr. Koga)
- 15) The sample administration manual contains matters relating to EPC and completion inspection, it is confusing. We cannot establish, since there is no O&M Manual prior to the start of operation. It would be better to divide into two parts: construction stage and maintenance. (Mr. Thu)
- 16) It shows a sample from the planning of project to the start of the operation consistently. It is not required in the power station which began operation. (Mr. Koga)
- 17) We agree with the principle of JICA totally as well as PV-Power as a consultant company. (Consultant)
- 18) There is a limit on the resource, although there are parties who require “how to design” for Vol.2. We want all parties to purchase by themselves various standards that are introduced back in the guidelines for insufficient part. (Mr. Koga)
- 19) Has guideline a legal status? (Mr. Thu)
- 20) Guideline has no legal status. (Mr. Cuong)
- 21) I request people in Ca Mau power station to peruse draft of Vol.2&4&5 and point out comments as power plant site of the field, because we received three parts for. (Mr. Thu)
- 22) We want to regard that the guideline is not TCVN, is not how to design but is a

summary of the points to be kept in mind during planning stage. The guidelines are interpretation of mandatory regulations, are introduced a sample how to achieve requirement and the introduction of reference standards. The guideline is a guide for help. (Mr. Koga)

- 23) How to confirm the quality after periodic inspection of GT. (Ca Mau power station)
- 24) You must confirm the cracks of rotor blade, peeling of TBC (thermal barrier coating), pulling of the cooling air holes, the center ring as a large rotating machine and the like. (Mr. Koga)
- 25) How must we evaluate the quality of the results of the turbine maintenance? (Ca Mau power station)
- 26) You must confirm the quality according to the check list and measurement list whether inspection result is OK or measurement result are within the allowable value provided by the manufacture. (Mr. Koga)
- 27) We want you to provide what to be checked in the guidelines. (Ca Mau power station)
- 28) The items to be inspected have been provided in Vol.5. However, it is difficult to provide detailed matters because of resources. (Mr. Koga)
- 29) Although the regulation has prescribed that the periodic inspection of GT is once within six years in Chapter 4 of Vol.5, we carried out once in three years. (Ca Mau power station)
- 30) The six years means that large scale inspection must conducted once within six years. Owner may carry out major inspection in a short interval, combination of the full overhaul, overhaul on a partial half, only the combustor inspection and inspection by bore-scope depending on the state of each power plant. (Mr. Koga)
- 31) Where is written tests of the safety valve after maintenance? In addition, how about the inspection interval? (Mr. Hung)
- 32) It is shown in Article 139 of Vol.5. There are no force matters for safety valve such as “must be done within any years”. Owner may carry out on voluntary basis, taking into account the leakage, etc. during operation. (Mr. Koga)
- 33) Must inspections of the safety valve be done after removing it? (Mr. Hung)
- 34) The safety valve is tested at the factory if it is removable for gas and LNG type. It must be tested after maintenance at the site. if it is not removable by reason of weld construction in such case of large boiler, (Mr. Koga)
- 35) Although it is a simple question, how do you think whether are the mandatory regulation must be the detailed one prescribing detail requirement or simple? (Mr. Koga)
- 36) Concepts such as PPT are rational; those which prescribed in the technical standards must not prescribe in the mandatory regulation. (Mr. Hung)

37) Although this PJ is continued until next year, we want JICA to finish them which contribute us effectively with hearing the opinions of the power generation units. I request Ca Mau power station to read the document and provide comments, .since it is closely related to us. (Mr. Hung)

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## 5. Minutes of Meeting with Vinacomin-Power

|   |           |   |
|---|-----------|---|
| Date and Time:  |           | 29/Aug/2012 14:00~16:30                                 |
| Vietnamese Counterpart:   |           | Vinacomin-Power   |
| Venue:  |           | Meeting room in Vinacomin-Power                         |
| Participants:   | Vinacomin | Mr. Thuc (Manager of Technical Department)              |
|   | Power     | Mr. Hue, Mr. Yen  |
|   | MOIT      | Mr. Cuong   |
|   | ETC1      | Mr. Yen   |
|   | JICA      | Mr. Koga, Mr. Higo (Mechanical)<br>Interpreter: Ms. Thu |
| Contents  |           |   |
| <p>1. Today's agenda (Mr. Cuong)</p> <p>(1) I provided the meeting to explain an overview of the technical regulations and guidelines which is being developed by JICA and to exchange opinions on the Draft of them.</p> <p>2. Contents of discussion</p> <p>(1) Introduction of Vinacomin-Power (Mr. Thuc)</p> <p>1) Vinacomin-Power belongs to the group of Vinacomin (Coal Corporation), is responsible for power generation.</p> <p>2) Power plants in operation are five, total output is 1,400 MW. The four of them are made in China, one is made in Japan. All of them are adopted the method of CFB.</p> <p>3) The original core business of Vinacomin is coal mining. We are performing power generation as the use of low grade coal that cannot be exported.</p> <p>(2) Project outline (Mr. Cuong)</p> <p>1) We are reviewing and creating the technical regulations and the guidelines to be applied in Vietnam divided into three groups of network, hydro and thermal. We want to make something that can be used in design, operation, maintenance and management work.</p> <p>2) The new regulations will be mandatory one instead of Old Norms.</p> <p>3) There is a difference about the degree of the progress on science and technology and the legal system between Vietnam and Japan. In the field of thermal, Draft has been created on the premise of a rule that Owner selects under the open rule, on the other hand, it has been issued the request that it is better to add stipulation about the state control from Vietnam side.</p> <p>4) Therefore, I provided an opportunity to discuss with relevant organizations and</p> |           |   |

JICA experts in this mission.

(3) Briefing from JICA (Mr. Koga)

- 1) The positioning and role of technical regulations, guidelines, voluntary standards and administration manuals has been explained by PPT.
- 2) There are works to review parts that Old Norm was promulgated to change QCVN, to replace TCN to QCVN, and to create a new part there was no.
- 3) After Vietnam joining WTO, it has become necessary to introduce the global standard. We have created as along it.

(4) Exchanging opinions

- 1) Is there any sample “how to design the equipment” in Vol. 2 guidelines? (Mr. Thuc)
- 2) There is no. Owner could do a simple design such as the piping; however, he does not design facility such as ST, GT and BLR by themselves. He must use the reliable standards. We have introduced reference standards in the guidelines for Owner who does not know the relevant standards. The concrete and detail design standards of ST, GT, and BLR only exists in the design room of large manufacturers. However, there are standards that are prescribed the recommendations of the purchase specifications when purchasing facility. (Mr. Koga)
- 3) The guidelines have no legal status. We are establishing guidelines as a guidebook or guidance, since it is unkind if only mandatory regulations. (Mr. Koga)
- 4) The relationship between range of selection by Owner and the requirement on safety has been explained by automobile as an example. Portion that exceeds the minimum redundancy of control and protection device in power station is the range of Owner’s selection. (Mr. Koga)
- 5) Is there GB (Chinese Standard) which is popular in Vietnam for making contract related to ST in the list? (Mr. Thuc)
- 6) GB is not introduced in the guidelines. The standard of Russia, China and France is the same as well. Vietnam Standard Such standards must be evaluated, examined and certified as the authorized standard which may use. We never say that GB is not applicable. It should be selected in the range of voluntary selection. Voluntariness and responsibility are two sides of the same coin. If the result was bad, Owner should be incurred by himself. (Mr. Koga)
- 7) Now, ASME and the equivalent standard are required in many cases. We do not know the meaning of “equivalent”. (Mr. Thuc)
- 8) There must be a list of voluntary standard recognized in Vietnam. (Mr. Koga)
- 9) The standard which we often refer is ISO, GB following it other than ASME. In addition, we refer IEC. (Mr. Thuc)

- 10) DIN and BS have almost same content as ISO. (Mr. Koga)
- 11) There are a lot of standards on boiler and pressure vessel. But, there is no standard of ST, GT and coal handling equipment and the like. API is referred by party such as PV-Power who uses gas, petroleum and liquefied natural gas. (Mr. Koga)
- 12) The foreign standards are often referred, since he is so rich and the imported facilities are applied. (Mr. Thuc)
- 13) I feel that the content is overlapped between Vol.4&5 and Old Norm when I tried to read the draft of technical regulation. Compared to Old Norm and Draft, there is no description about the frequency of periodic inspection of the running plant in Old Norm. There are power stations that they carried out minor inspection every year, but have not carried out large scale inspection among 6~7 years. Old Norm has not written anywhere how we may extend the life of the power stations while driving the most economical power stations. (Mr. Thuc)
- 14) The stipulation that “ major inspection of generation facility must be carried out within 6 years” is provided as interval for major facility, since many people are worried about it, though we explained it is the Owner’s selection. It is necessary to grasp the status of their own power station and make the maintenance plan along with the inspection contents. It is necessary to take the measures how to reduce stop time in the long term span in order to operate power plant efficiently. (Mr. Koga)
- 15) It depends on whether the equipment is reliable or not, and the effort to reduce the stop time by good inspection and maintenance in the process of operation. Owner will need to decide the good balance. We can write the general statement, but cannot write it fine. (Mr. Koga)
- 16) Is not there a material for a large scale inspection? (Mr. Thuc)
- 17) CFB has a tendency that local damage is higher than the conventional boiler. If you operate a certain period of time, it will be clear where the trouble is concentrating. (Mr. Koga)
- 18) The visible trouble has been grasped generally; however, any reference material is necessary for other trouble. (Mr. Thuc)
- 19) We will be able to increase the thickness of the guidelines, if we collect information by means of spending time and money. But, it depends on the degree. (Mr. Koga)
- 20) We understand that it is difficult to provide the detail contents of various equipments for a lot of power stations. (Mr. Thuc)
- 21) It is better to have the attitude that you are pioneers and there is no past performance. There are lots of sample of trouble and measures for CFB. (Mr. Koga)
- 22) Is not the CFB the major technology in Japan? (Mr. Thuc)
- 23) CFB is not applied for a major plant. The leading plant is the large scale and high

performance plant that is applied in global standard coal. It is a minor plant that is applied waste or solid fuel. (Mr. Koga)

24) Do you want the thick one which containing detailed requirements or simple one?

Do you want the regulation with many requirements and mandatory matters? (Mr. Koga)

25) We want JICA to establish something easy to use containing details as much as possible. (Mr. Thuc)

26) If there are comments, I ask you to send it by e-mail. (Mr. Cuong)

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## 6. Minutes of Meeting with Institute of Energy

|   |      |  |
|---|------|--|
| Date and Time:  |      | 30/Aug/2012 8:35~11:30   |
| Vietnamese Counterpart:   |      | IE (MOIT Institute of Energy)  |
| Venue:  |      | Meeting room in IE   |
| Participants:   | IE   | Mr. Duong (Director of the consulting center in IE)<br>Ms. Ha (Manager of Electrical and Automation Department)<br>Mr. Shin (engineer of GT and S)<br>Mr. Sun (engineer of electric equipment) |
|   | MOIT | Mr. Cuong  |
|   | ETC1 | Mr. Yen  |
|   | JICA | Mr. Nakamura (Project Team Leader)<br>Mr. Koga, Mr. Higo (Mechanical)<br>Mr. Egashira (Electrical),<br>Interpreter: Ms. Ha   |
| Contents  |      |  |
| <p>1. Today's agenda (Mr. Cuong)</p> <p>(1) We are reviewing and updating of technical regulations applied to the power plant with the assistance of JICA. This time, we have arranged the opportunity to seek the advice from IE against the establishment policy of JICA for technical regulations and guidelines related to thermal power plants.</p> <p>2. Contents of meeting</p> <p>(1) About IE (Mr. Duong)</p> <p>1) We are performing the consultation work about environment, nuclear and energy matters. Business as an example;</p> <ul style="list-style-type: none"> <li>➤ Creating purchasing specifications by requests from power plant investors. Clients are EVN, PV-Power and Sumitomo etc.</li> <li>➤ Administration of construction work after contract</li> <li>➤ Research asked from MOIT and advice to MOIT</li> <li>➤ Engineering study and study of thermal and nuclear power</li> <li>➤ Advice for each new project</li> <li>➤ FS</li> </ul> <p>2) IE has 200 employees in total. 40 people are working in this center.</p> <p>3) There are many creation jobs for EPC Contract of the power plant made in China. Although we have not created EPC Contract of combined cycle, we made some examinations for contract.</p> <p>(2) Description of creation policy based on the regal system pyramid PPT (Mr. Koga)</p> |      |  |



1) The positioning, role and the basic creation policy of mandatory standards, voluntary standards and administration manuals have been explained according to the regal system pyramid PPT.

(3) Discussion about the regulation

1) We have looked over the regulations and guidelines that have been distributed in advance at once. (Mr. Duong)

2) I think that the norm is mandatory, but the regulation is voluntary in Vietnam. Is the technical regulation which JICA has created the guideline rather than the norm? Mr. Duong confirmed to Mr. Cuong that “Did MOIT ask to JICA clearly what you want to do?” The explanation of JICA is the same as our idea, we agree with JICA. (Mr. Duong)

3) The performance must be prescribed in contract; though the detailed requirement is not required. (Mr. Duong)

4) Mandatory regulation which we are creating is requirement on safety. (Mr. Koga)

5) How does MOIT think the method how to use these documents? In the current situation of Vietnam, it would be confused if all things related to the power stations were promulgated openly (those with more choices of Owner). It may be better to provide the fine things in the mandatory regulation. (Mr. Duong)

6) MOIT may regard that it is necessary to provide everything in the regulation from the view point to control and manage state. However, we think that it is not the scope of the technical regulations we create. For example, the size of the power station, performance level, the number of auxiliary equipment or coal storage capacity and the like. (Mr. Koga)

7) It is not bad to provide detailed requirement, if they were precise. However, it will not be a substantial mandatory regulation even if putting the detail matter into regulation, if it becomes to no action without any written instruction, or if there is no system to verify what is performed and conformed. (Mr. Koga)

8) Each project is checked by the acceptance committee at completion. (Mr. Duong)

9) Even if there are fine matters were prescribed in the regulations of operation, it is titular if there were no system to verify the fact. (Mr. Koga)

10) The something in principle should be provided, since it may not fine. For example, such as road width standards of MOC, the thickness of the floor or the height of the ceiling and the frequency of inspection of fire prevention and extinguishing equipment. (Mr. Duong)

11) We do not mean that it is no need at all. Such frequency for inspection of fire prevention and extinguishing equipment should be specified in the administration manuals at each power station. (Mr. Koga)

12) There are a lot of choices of the method. (Mr. Egashira)

- 13) It is necessary to provide the concrete number which everyone must conform as standard such as the width of road, the width of vehicle, the width of railroad, the cant of railroad and the like. If there are not these numbers in the regulation, it is the fact that they should be selected on a voluntary basis. The numbers that everyone should comply. (Mr. Koga)
- 14) Such number is not provided in the regulations. (Mr. Duong)
- 15) It is no need to provide the number except the classification of voltage, frequency and line limits etc. It is no need to provide the stipulation that how much the number of revolutions. (Mr. Koga)
- 16) There are opinions that performance levels should be put in the regulations as a matter of state control. However, we think safety and performance are different matter. The performance should not be a mandatory matter which everyone should be observed. It is trouble that in the regulations, if we put that thermal efficiency should be kept more than 50%. (Mr. Koga)
- 17) MOIT should consider the regulations for the performance, since IE and JICA are not in position to determine. (Mr. Duong) (Mr. Koga)
- 18) Speaking from my experience, many Owners require something cheap rather than high performance. (Mr. Duong)
- 19) It is general to put the strict stipulation in the contract, since Owner wants to purchase a high performance one. Even when he receives the equipment, he receives after verifying strictly. The concrete numbers will be appearing in the contract. (Mr. Koga)
- 20) Are there any penalties, if the mandatory matters have not been conformed to? (Mr. Higo)
- 21) There are penalties for violations of individual regulations. For example, the Resource and Environment Department checks about dust. If it is violated, the shutdown command is possible. The penalty for the equipment for power generation is defined when promulgating the regulations by MOIT. (Mr. Duong)
- 22) For reference, I will speak to the current situation of Vietnam. (Mr. Duong)
  - Performance guarantee of EPC Contract is two years after receipt by Owner in Vietnam.
  - The reference law for EPC Contract in Vietnam is the law relating earthquake, fire, grid code and safety.
  - In Vietnam, there is no system of the safety management examination such as those which is conducted in Japan. Check system is not enough other than those which is carried out by Owner.

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## 7. Minutes of Meeting with Electricity Vietnam

|  |      |  |
|--|------|--|
| Date and Time:   |      | 31/Aug/2012 8:40~11:30   |
| Vietnamese Counterpart:  |      | EVN (Electricity Vietnam)  |
| Venue:   |      | MOIT Meeting room 204  |
| Participants:  | MOIT | —  |
|  | EVN  | Mr. Tien, Mr. Thong, Ms. Hien  |
|  | ETC1 | Mr. Truong   |
|  | JICA | Mr. Koga , Mr. Higo (mechanical)<br>Mr.Egashira (Electrical)<br>Interpreter: Ms. Nga |
| Contents   |      |  |
| <p>1. Today's agenda (Mr. Koga)</p> <p>(1) Opinion exchange on electrical matter in guideline using comment sheet from MOIT(Ver.3 )</p> <p>(2) Opinion exchange on the comment sheets submitted from EVN to MOIT on 24/Aug concerning control</p> <p>(3) Reference</p> <p>1) Comment table from MOIT</p> <p>2) Comment table from EVN 24/Aug</p> <p>2. Contents of meeting</p> <p>(1) Comments in the comment sheet from MOIT (Ver.3)for electrical matters(Vol.2)</p> <p>1) Item-4 Article 231-10: Electric field strength under the electric wire</p> <ul style="list-style-type: none"> <li>➤ I revised in accordance with the Vietnamese requirement, from the ones that have been proposed in the technical standards of the Japan. Therefore, I want the revised guidelines to be confirmed again. (Mr. Egashira)</li> <li>➤ Guidelines for the effects of electric field on the human body are not available in Vietnam so far. Although it is regulated below 5kV / m in all places, and 1kV / m at 1m above ground inside the room, is it not the difference in indoor and outdoor in Vietnam, field inside the room depends on the material of buildings. Therefore, we need to refer the value of the international standard. Regulation in Vietnam considers transmission line located in the residential area. (Mr. Tien)</li> <li>➤ In Japan, it is 3kV / m, (the degree to which hair bristle) regardless of inside or outside. As for this matter, I told the same thing at the previous revision of the regulation. Measures such as electric shield by using a conductive material or installing at higher area need to be taken, to lower the electric field. (Mr.</li> </ul> |      |  |

Egashira)

- I want you to write the effects of the electric field strength the on human in this guideline. (Mr. Tien)
- All over the world including Japan, there is no knowledge of boundary value completely safe to human. (Mr. Egashira)
- It is the same as the biological effects of radiation, there is no clear values of the limit. (Mr. Koga)
- Matters which require regulations should be decided in Vietnamese side, although the Japanese side can recommend or introduce technical matters. (Mr. Koga)
- I want to describe examples of the guidelines of other countries. (Mr. Tien)

2) Item-5 Article 254: Rated power of transformer in which protection should be installed

- In the old Vietnamese provision, it is 6.3MVA, and I want you to change. (Ms.Hien)
- Japanese standards stipulate the value not less than 10MVA. Currently, technical standards have changed to the value not less than 10MVA, therefore the value of 6.3MVA does not conform to the regulation of the final draft. (Mr. Egashira)
- Does the value 10MVA include the major transformers in Japan? (Mr.Tien)
- Yes. (Mr. Egashira)
- As for protection devices, what kinds of devices are used? (Mr.Tien)
- There are electrical relays, pressure relays, and electrical relays are common for protection. It depends on the capacity of transformer whether the oil-filled transformer is applied. (Mr. Egashira)
- The value 10MVA is prescribed in Article 254 of technical standards. (Mr. Egashira)
- The result from the network section is currently defined as not less than 6.3MVA. (Mr.Tien)
- Is it a provision of TCN because there is no QCVN for design currently? What you mean is it was prescribed in the TCN, isn't it? (Mr. Koga)
- It was prescribed in TCN. What we mean is that this value should be reflected in the upcoming QCVN. (Ms.Hien)
- Technically, there is no problem in the case of not less than 6.3MVA because we have experience in the case not less than 10MVA in Japan. (Mr. Egashira)
- Also, as for this matter, there is no provision in IEC. (Mr. Egashira)

(2) For comments about Vol.5 Electrical of Ver.4 from MOIT

1) Article 171-a)-1: Change the title of the inspection of protective equipment and measurement devices

- In principle, task from Vietnam to JICA, from JICA to WJEC, and matters only electrical equipment, and did not contain a control device. This is outside from the scope of work. I have been described from the beginning of this project. Even so, the protective device and measurement device is included as a service. (Mr. Koga)
- I don't understand the MOIT and JICA relationship, but the control devices are important. (Mr. Thong)
- Even if it is described, Egashira will explain whether control devices are described as the regulation. (Mr. Koga)
- Even if it is described all, I want consistent guidelines. (Mr. Thong)
- The title is in accordance with the regulation. Originally, the regulation prescribes that instrument should be calibrated properly. (Mr. Egashira)
- Only protective equipment and measurement devices are described, but there is no description of inspection of the control device. (Mr. Thong)
- Some of them are described in the guidelines in the Table Table174a1. It is not true there is no description. (Mr. Egashira)
- The concept of control system is explained by referring diagrams in the papers submitted this time. Blue is in the range of normal operation, yellow is in the range of the alarm, red is in the range of the heavy failure. Abnormal condition in the blue and yellow range is detected by instrument. Red is a final protection area which safety devices such as safety valve or over speed stop device. Control device, may be operate in the range of blue, red and yellow range is prevented to enter by protective devices. From the point of security, the control devices are only recommendation. (Mr. Egashira)
- By referring figures of "inspection of the control device" or "inspection of the measuring devices", valve opening is checked according to signals, and failure of software is checked. Because it is rude to write something like this, I did not mention. In addition, the software check may not be carried if it is not modified by assuming the software has no problem. Check items may be valve opening and output of control signals depending on the condition. (Mr. Egashira)
- Japan has a lot of experience, but the employees in Vietnam do not know how to calibrate or adjust, even if they know how to operate. (Mr. Thong)
- For example, because of differences of valve opening characteristics, it is impossible to describe each instrument and control device inspection,

adjustment and calibration method in detail. Inspection of control devices will not be described in the regulation. (Mr. Egashira)

- I want JICA to describe conceptual diagram for control device inspection in guidelines. (Mr. Thong)
- From the position to operate facilities, EVN is necessary reference books on how to and what to do in the field. If reference books are out of the scope of this work, I want you to consult with MOIT. (Ms. Hien)
- There is no standard like that (such as how to check control device) in IEC. (Mr. Egashira)
- The level which you are requiring can be referred by manufacturer's instructions or international. (Mr. Koga)
- In the standard or guidelines I want you to describe the spirit of the theory, see "The control devices shall be inspected in the periodic inspection." (Mr. Thong)
- I understand you want to know in the detail, but the frequency and method of inspection items should be shown from the manufacture as O & M Manual when you receive a power plant. (Mr. Koga)
- Why are not they described?(Ms. Hien)
- The items are no mandatory, and should not be stipulated in the standard as mentioned before. (Mr. Egashira)
- The old provision stipulates, control devices must be inspected periodically in accordance with the procedure approved by the vice president of the power plant. (Mr. Thong)
- We require that each power should specify the rule to inspect in detail and perform inspection, according to the pyramid. I advise you to define concerning measuring device in periodic inspection procedures by referring the instrument manufacturer's instructions. (Mr. Koga)
- I understand. However, if you do not write to mandatory standards, personnel in a power plant do not do. (Ms. Hien)
- The idea that it is no problem as long as according to the provision which someone decide is no use. It leads to the fact that I will not do because it is not written, on the contrary. (Mr. Koga)
- Example Figure will be added to the guidelines. (Mr. Egashira)
- Consciousness of Vietnamese personnel is low. (Mr. Thong)
- Even if it is socialism, "Change" is mandatory. Vietnam will not be able to get along with other nations in the world. (Mr. Koga)
- EVN group has long experience; therefore there may be a lot of written procedures accumulated. (Mr. Koga)

- Power plant is gradually tends to not do. Maintenance manual is simple in Vietnam and there is a case without a manual. If failed, we buy new ones. We do not maintain by ourselves. (Mr. Thong)
- It is the choice of the owner. (Mr. Koga)

(3) For comments on Vol.2 Electrical of Ver.4 against from MOIT

1) SCADA/EMS Article 258-1:

- Examples are shown in the Guideline. (Mr. Egashira)
- The overall reference figure describing DCS only is not contained. (Mr. Thong)
- DCS is described in Article 258 of the July edition. A diagram of the SCADA and DCS figure are included. The DCS is illustrated separately according to the function. (Mr. Egashira)
- Maybe, what I saw was probably the old version. I want to make main facilities described. (Mr. Thong)
- The SCADA / EMS do not describe, FCS, HMI. (Mr. Thong)
- Function of SCADA is to output kick signals or set values and collect information, and has no direct control function to the field actuator. DCS has the function to control the field actuator. (Mr. Egashira)
- We would like to know more about DCS rather than SCADA. (Mr. Thong)
- The Human Interface is equipped with both SCADA and DCS which SCADA is not equipped together. (Mr. Egashira)
- I want you to write the main part of DCS more in detail. (Mr. Thong)
- In the power plant, SCADA and DCS are equipped together. (Mr. Egashira)
- Like Centum by Yokogawa, there is also a DCS that are not equipped as SCADA especially. The image is understood. (Mr. Egashira)
- ICMS means Integrated Control Management System. (Mr. Koga)
- The comment on the control device is too general and has no specific requirement, therefore we cannot answer. For example, item such as redundancies described in the guideline. (Mr. Koga)
- If they are mentioned in the guidelines, it is no problem. (Mr. Thong)
- As for comment which we received 31 August concerning control devices, no action will be taken. (Mr. Koga)

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## **Appendix-7**

### **Conclusion Tables of Comments on Guidelines**

**(after Progress Report No.2)**

- 1. Hydropower Group**
- 2. Thermal Power Group**
- 3. Network Group**



## **Appendix-7.1**

### **Conclusion Table of Comments on Guidelines (after Progress Report No.2)**

#### **1. Hydropower Group**

1. Conclusion of Comments on Guideline Vol.4 and Vol.5 (Hydropower Part)

(Prepared on 10/1/2013)

| No. | Vol. | Article & Paragraph    | Comment   | Proposed Solution for Revision  | Classification  |                   | Unit         | Result of Review by JICA side   |   | Conclusion |  |
|-----|------|------------------------|---|---|-----------------|-------------------|--------------|---|---|------------|--|
|     |      |                        |   |   | Technical issue | Translation issue |              | Proposed Solution for Revision  | Final Solution  |            |  |
| 1   | 4    | TR Article 73          | Propose to revise "Board on flood control"  | Article 73. "The Steering Committee on prevention and protection against flood, typhoon" shall be organized for each hydro power plant before flood season annually, in order to investigate and examine thoroughly activities of flood control for civil works and equipment, especially spillway gates, outlet works and procedures to release flood.   |                 | x                 | ATMT         | The term "Board on flood control" is used in the existing QCVN Vol.6 in Article 73. It shall be confirmed with the Vietnamese side if the organization "Board on flood control" shall be replaced with "Steering committee on prevention and protection against flood and typhoon".   | VN side confirmed that it is not necessary to replace the term, "Board on flood control" with "Steering committee". (Concluded in WG Meeting on Oct.23, 2012)   |            |  |
| 2   | 5    | TR Article 100-a5      | Propose to revise according to provisions in Circular No. 34/TT-BCT dated on 07 Oct 2010 of MOIT.                     | To add item (7) in the 1st Paragraph as follows:<br>1. For reservoirs having capacity equal or larger than 10,000,000 m3;<br>(1) Assessment results of dam management works;<br>(2) Check and analysis of dam monitoring data;<br>(3) Check and assessment of quality and safety of a dam;<br>(4) Check of the situation of reservoir sedimentation;<br>(5) Recalculation of flood flow into a reservoir and review on flood control capacity of a reservoir according to the present dam design regulations and to the latest meteorological and hydrological data; and<br>(6) Assessment of works in relation to prevention and protection of dam against floods and typhoons.<br>(7) Calibration unit must be made detail report and must take judgment responsibility on calibration results.<br>2. For reservoirs having capacity of less than 10,000,000 m3;<br>(1) Assessment results of dam management works;<br>(2) Recalculation of flood flow into a reservoir and review on flood control capacity of a reservoir according to the present dam design regulations and to the latest meteorological and hydrological data; and<br>(3) Assessment of works in relation to prevention and protection | x               |                   | ATMT         | The word "calibration" does not appear in Circular No. 34/TT-BCT in English version. It shall be confirmed with the Vietnamese side if the word corresponding to "calibration" appears in the original Vietnamese version of Circular No. 34/TT-BCT.<br><br><u>The issue of calibration of equipment is provided in Article 122 of Vol.5 as follows:</u><br>1. Official calibration shall be performed for measuring instruments used in monitoring and observation for performance of facilities and relevant natural conditions. This provision shall be applied to the instruments for which the official calibration is mandatory; and<br>2. As for the other measuring instruments except for those prescribed in the preceding paragraph, normality of the measuring instruments shall be checked by comparing with results of other independent measurement if applicable. | In conclusion, VN side and JICA Team side agreed that it is not necessary to add Item (7) in Paragraph 1. (Concluded in WG Meeting on Oct.23, 2012)   |            |  |
| 3   | 5    | TR / GL Article 100-a6 | Propose to revise according to provisions in Circular No. 34/TT-BCT dated on 07 Oct 2010 of MOIT.                     | The first periodic inspection for dam safety shall be carried out <b>within the next year</b> from the date when the reservoir water level reaches the normal high water level.   | x               | x                 | ATMT         | The provision "The first periodic inspection for dam safety shall be carried out <b>within the next two years</b> from the date when the reservoir water level reaches the normal high water level." is prepared based on the following fact:<br>- Article 7 of Circular No.34/2010/TT-BCT stipulates that "The first inspection shall be conducted <b>within the second year from the initial impounding date to normal water level of reservoir.</b> "<br>- However, the definition of "within the second year" is not clear but may mean "after one year period from the initial impounding".<br>- Therefore, description of " <b>within the next two years</b> " is applied to Article 100-a6 in order to allow earlier inspection <b>within the next year.</b>   | VN side reported that the current Vietnamese version means that the first periodic inspection for dam safety shall be carried out between the period one year after the date when the reservoir water level reaches the normal high water level and two year after the date. In conclusion, the description in TR Vol.5 Article 100-a5 is revised as follows:<br>" - - <b>within the second year</b> from the date when the reservoir water level reaches the normal high water level." Also, it is concluded that <b>the period in which the first periodic inspection shall be conducted will be indicated in a figure in the Guideline</b> in order to avoid misunderstanding. (Concluded in WG Meetings on Oct.23, 2012 and Jan.10, 2013) |            |  |
|     |      |                        |   |   |                 |                   |              |   | <p>The diagram shows a timeline from Year 1 to Year 3. A vertical line marks the 'High water level' at the start of Year 1. A horizontal arrow labeled '1 Year' spans from the high water level to the start of Year 2. A horizontal arrow labeled '2 Years' spans from the high water level to the start of Year 3. A box labeled 'First periodic inspection for dam safety shall be conducted within this period of time' is shown between the end of Year 1 and the start of Year 3. A box labeled 'Completion Inspection' is shown at the end of Year 1.</p>  |            |  |
| 4   | 5    | GL Article 100-a8      | The reason to closes a valve of a drain hole in a gallery before measuring uplift shall be clarified in Paragraph 2). | In Vietnam, it is common practice to install uplift measuring devices for specific purpose separately from the drain holes. So, the second sentence of item 2) shall be supplemented by adding the phrase "in case a valve is installed in a drain hole to measure uplift" at the end of the sentence as follows:<br>"An inspector of the Owner closes a valve of a drain hole in a gallery, leaves it closed for a sufficient time until the scale on a pressure gauge installed in a valve gets settled and reads the scale <b>in case a valve is installed in a drain hole to measure</b>  | x               |                   | WG1 (Jan.10) | It is common practice in Japan that uplift is measured using a drain hole, so a valve is installed in it and it is closed before measuring uplift. The provision recommended by Vietnamese side is applied to a dam where a valve is installed in a drain hole to measure uplift.   | The solution proposed by Vietnamese Team is agreed. So, the item 2) of Article 100-a8 will be revised accordingly. (Concluded in WG Meeting on Jan.10, 2013)  |            |  |

# 1. Conclusion of Comments on Guideline Vol.4 and Vol.5 (Hydropower Part)

(Prepared on 10/1/2013)

| No. | Vol. | Article & Paragraph | Comment   | Proposed Solution for Revision  | Classification  |                   | Unit         | Result of Review by JICA side   |   | Conclusion |  |
|-----|------|---------------------|---|---|-----------------|-------------------|--------------|---|---|------------|--|
|     |      |                     |   |   | Technical issue | Translation issue |              | Proposed Solution for Revision  | Final Solution  |            |  |
| 5   | 5    | GL Article 108      | The contents of Paragraph 3 "Sedimentation" in Vietnamese version is difficult to understand.   | It is recommended to review and revise the sentences in the Paragraph 3 in Vietnamese version.  |                 | x                 | WG1 (Jan.10) | Translation issues in Vietnamese version shall be solved by Vietnamese side.  | ETC will review and revise the Vietnamese version properly. (Concluded in WG Meeting on Jan.10, 2013)   |            |  |
| 6   | 5    | GL Article 113      | Stability of the slope shall be watched carefully after not only heavy rain but also earthquake.  | The 1st sub-item shall be revised as follows:<br>"Especially, stability of the slope shall be watched carefully after heavy rain <u>or earthquake</u> ."  | x               |                   | WG1 (Jan.10) | It is reasonable to conduct emergency inspection after not only heavy rain but also earthquake to watch stability of the slope carefully.   | The solution proposed by Vietnamese Team is agreed. So, the 1st sub-item of Article 113 will be revised accordingly. (Concluded in WG Meeting on Jan.10, 2013)  |            |  |
| 7   | 5    | GL Article 116      | The source of stipulation regarding inspection items shall be clarified.  | The reference document shall be described specifically . So the 1st Paragraph of Article 116 shall be revised as follows:<br>"Operating method and limit value of standby power supplies are different in each model, so inspection procedure should be determined for each device satisfying the requirements of inspection items listed in Technical Regulation Vol.5 Article 116". | x               |                   | WG1 (Jan.10) | The solution proposed by Vietnamese side is reasonable.   | The solution proposed by Vietnamese Team is agreed. So, the word "Technical Regulation Vol.5" shall be attached before "Article116" in the 1st Paragraph of Article 116 to distinguish a provision of QCVN from Guideline. (Concluded in WG Meeting on Jan.10, 2013)  |            |  |
| 8   | 5    | TR Article 120      | Propose to add on paragraph 2 "... If the developing erosion which may damage to surrounding environment, proper methods must be taken".  | To revise Paragraph 2 as follows:<br>"The developing of erosion must be small. If the developing erosion which may damage to surrounding environment, <u>proper methods must be taken</u> ".  | x               |                   | ATMT         | This article regulates inspection items in the periodic inspection and implies that "If the developing erosion which may damage to surrounding environment is observed, it is obvious that proper methods must be taken" as recommended by the Vietnamese side. In the above regard, it is not necessary to modify Article 120.   | The meaning of the proposed provision is implied in the existing Article 120, so it is not necessary to add the provision proposed by Vietnamese side into Article 120. (Concluded in WG Meeting on Oct.23, 2012)   |            |  |
| 9   | 5    | TR Article 120-a1   | Propose to add "... deteriorate significantly, it must be met requirements of supplying water for agriculture".   | To revise the 1st item as follows:<br>"Water quality in a reservoir measured by proper method does not deteriorate significantly, <u>it must be met requirements of supplying water for agriculture</u> ."  | x               |                   | ATMT         | The JICA Project Team proposes that the provision recommended by the Vietnamese side <b>could be accepted in general</b> but should be revised as "Water quality in a reservoir measured by proper method does not deteriorate significantly, <b>and it shall satisfy the requirements of water quality for agriculture</b> ".  | The solution proposed by JICA Team is agreed. So, the 1st item of Article 120-a1 will be revised accordingly. (Concluded in WG Meeting on Oct.23, 2012)<br><br>It was confirmed that the term "water quality" is not translated into Vietnamese correctly. Accordingly, Vietnamese version shall be revised to show the correct meaning of "water quality".   |            |  |
| 10  | 5    | TR Article 121      | Propose to add on paragraph 1 "Measuring instrument must be checked before use and there shall be no serious damages on measuring instruments or relevant structures".  | To revise Paragraph 1 as follows:<br>" <u>Measuring instrument must be checked before use</u> and there shall be no serious damages on measuring instruments or relevant structures."   | x               |                   | ATMT         | This article describes general requirements for conditions of measuring instruments as explained in the Guideline and the article implies that inspection should be carried out before use of measuring instruments. Also, the requirement for calibration of measuring instruments is provided in Article 122. In the above regard, it is not necessary to modify Article 121.   | The solution proposed by JICA Team is agreed, so that it is not necessary to modify Article 121. However, the Vietnamese version shall be revised to show the correct meaning of "measuring". (Concluded in WG Meeting on Oct.23, 2012 and Jan.10, 2013)  |            |  |
| 11  | 5    | TR Article 121      | Propose to add on paragraph 2 " The site where measuring instruments and relevant structures are installed shall be safe and stable, and free from unfavorable obstacles for measuring from surrounding environment; and" | To add Paragraph 2 as follows:<br>"2. The site where measuring instruments and relevant structures are installed shall be safe and stable, and free from unfavorable obstacles for measuring <u>from surrounding environment</u> ; and"   | x               |                   | ATMT         | The modification of Article 121 Paragraph 2 proposed in the comment is acceptable in general. However, the JICA Project Team proposes that the provision recommended by the Vietnamese side should be revised as follows:<br>"Measuring instruments and relevant structures shall be installed at a site free from unfavorable obstacles for measuring <b>in surrounding environment</b> such as severe sedimentation etc., to maintain normal function." | The solution proposed by JICA Team is agreed, so that the Paragraph 2 of Article 121 will be revised by adding "in surrounding environment" after "for measuring" as recommended by JICA Team as well as by deleting "such as severe sedimentation etc." as both sides agreed in the meeting. (Concluded in WG Meetings on Oct.23, 2012 and Jan.10, 2013)<br><br>"Etc." will be added after "such as severe sedimentation" in |            |  |

## 2. Comments in 3rd Workshop on draft Guideline Vol.4 (Hydropower Part)

(Prepared on 10/1/2013)

| No. | Vol. | Article & Paragraph   | Comment  | Proposed Solution for Revision | Classification  |                   | Unit         | Result of Review by JICA side  |  | Conclusion |  |
|-----|------|-----------------------|--|--------------------------------|-----------------|-------------------|--------------|--|--|------------|--|
|     |      |                       |  |                                | Technical issue | Translation issue |              | Proposed Solution for Revision   | Final Solution   |            |  |
| 1   | 4    | Article 5, Article 7: | These items have been regulated in Electrical Law, if you make citation to put in to the regulation, discrepancy appears and it is easy to understand and apply in the wrong way. The thing we should do is to indicate the reference to Electrical Law. |                                | *               |                   | After WS     | There should be no quotation of the provisions in the existing laws or regulation in the mandatory Technical Regulation in general.<br>On the other hand, quotations of the existing laws, regulations and standards are sometimes useful for easy reference in the voluntary Guideline.   | No revision is required in the current draft of TR and GL in general.<br>(Concluded in WG Meeting on Jan. 08, 2013)  |            |  |
| 2   | 4    | Article ?             | It is desirable that a list of taking over items of information including conditions of each device in a powerhouse in changing a shift should be prepared.  |                                | *               |                   | PECC2        | It is not necessary to record all conditions of each device in a powerhouse in a diary for shift workers. Only special mentions such as abnormalities in facilities shall be recorded.<br>Such a inspection is not dealing with in current version. JICA team presumes when the equipment is something in trouble, only such matter shall be taken over between operators. | It is not necessary to add the requested content in the draft GL.<br>(Concluded in WG Meeting on Jan. 08, 2013)  |            |  |
| 3   | 4    | Article 50            | The threshold shall be added regarding contents in Tables 50-1, 50-2 and 50-3.   |                                | *               |                   | Can Don HPP? | Whether the phenomenon existed or not is the purpose of the measurement. If the abnormal result is found, the investigation for the cause is needed.   | It is not necessary to add the requested content in the draft GL.<br>It shall be indicated that Table 50-1 and 50-2 are examples of Japan and that the items in Table 50-3 are examples and not mandatory. |            |  |
| 4   | 4    | Article 50            | It shall be confirmed what are thresholds of deformation and water leakage in a dam and what measures shall be taken in case those observed values exceed thresholds.  |                                | *               |                   | Can Don HPP  | There are no clear thresholds. In case these values becomes more than those in the previous inspection, their cause shall be investigated and measures shall be taken.   | It is not necessary to add the requested content in the draft GL.<br>(Concluded in WG Meeting on Jan. 08, 2013)  |            |  |
| 5   | 4    | Article 50            | It shall be confirmed what are thresholds of uplift upstream and downstream of the curtain grouting line.  |                                | *               |                   | Can Don HPP  | In case values of uplift become more than design values, their causes shall be investigated by comparing with other monitoring items such as deformation and displacement of a dam body and measures shall be taken after comprehensive evaluation.  | It is not necessary to add the requested content in the draft GL.<br>(Concluded in WG Meeting on Jan. 08, 2013)  |            |  |

### 3. Comments in 3rd Workshop on draft Guideline Vol.5 (Hydropower Part)

(Prepared on 10/1/2013)

| No. | Vol. | Article & Paragraph | Comment  | Proposed Solution for Revision | Classification  |                   | Unit            | Result of Review by JICA side   |  | Conclusion |  |
|-----|------|---------------------|--|--------------------------------|-----------------|-------------------|-----------------|---|--|------------|--|
|     |      |                     |  |                                | Technical issue | Translation issue |                 | Proposed Solution for Revision  | Final Solution   |            |  |
| 1   | 5    | Article 79          | Regarding Article 79 "Insulation resistance measurement", difference between the following two formulae to calculate polarization index, P.I;<br>1) P.I = R10 / R1<br>Where,<br>R10: insulation resistance value measured at 10 minutes<br>R1: insulation resistance value measured at one minute<br>2) P.I = R60 / R15<br>Where,<br>R60 : insulation resistance value measured at 60 seconds<br>R15: insulation resistance value measured at 15 seconds<br>It is necessary to provide which formula shall be adopted. |                                | *               |                   | EVN             | This article proposes the formula of 1) and JICA Project Team will explain the difference between the above two formulae later.   | The methodology using each formula mentioned in "Comment" column will be described in the Guideline. (Refer to Item 5 "Other measuring factor absorptivity / absorptance (K)") which was added in Article 79 of the draft GL. (Concluded in WG Meeting on Jan. 10, 2013) |            |  |
| 2   | 5    | Article 90          | Regarding Fig.90-1 in Article 90 "Bearing operation/run", it seems dangerous to start test operation from 25% of rated revolving speed.  |                                | *               |                   | Da Mi HPP       | It is usual to start test operation from low revolving speed to confirm safety in case of initial installation and after repair of a bearing, which is common in technical regulations and specifications of each country.  | No revision is required in Fig.90-1 and the current content of Article 90 in the draft GL. (Concluded in WG Meeting on Jan. 10, 2013)  |            |  |
| 3   | 5    | Article 90          | Time for moving to the next revolving speed shall be described in Guideline.   |                                | *               |                   | Da Mi HPP       | Time required for moving to the next revolving speed depends on characteristics of a turbine. In an actual case, revolving speed shall be increased after confirming non-existence of abnormalities described in Article 90.  | No revision is required in the current content of Article 90 in the draft GL as the time for moving to next revolving speed varies depending on actual conditions. (Concluded in WG Meeting on Jan. 10, 2013)  |            |  |
| 4   | 5    | Article 92          | Regarding paragraph 2. of Article 92 "Load and input rejection tests", supplemental explanations shall be added to the sentence "at the same time with the time interval difference model".  |                                | *               |                   | PECC 3          | This provision regulates how to set a time interval of load rejection for more than one units connected to one line of penstock so that the severest conditions may be given to penstock and draft tubes. Article 92 of Guideline will be revised to provide clearer explanation. | Article 92 in the draft GL will be revised so as to provide clear explanation regarding particular case of load rejection test. (Concluded in WG Meeting on Jan. 10, 2013)   |            |  |
| 5   | 5    | Article 98-a1       | Regarding Article 98-a1, it shall be confirmed if values in Table 98-a1-1 are applied to vibration tests compulsorily or just for reference.   |                                | *               |                   | Da Mi HPP       | Values in Table 98-a1-1 are reference for vibration tests.  | It is confirmed that the values in Table 98-a1-1 are for reference. Accordingly, no action is required. (Concluded in WG Meeting on Jan. 10, 2013)   |            |  |
| 6   | 5    | -                   | It is desirable that a list of visual inspection items for civil structures and electrical equipment should be described in Guidelines.  |                                | *               |                   | PECC2           | Visual inspection items are included in those for civil structures. Most of inspection items for electrical equipment are related to tests of equipment, and it will be considered if visual inspection items should be added to the existing items.                              | No action is required as the test items already listed in TR and GL for electrical equipment satisfy the requirements. (Concluded in WG Meeting on Jan. 10, 2013)  |            |  |
| 7   | 5    | -                   | It shall be confirmed if there are any stipulations regarding maintenance procedures for standby power supply.   |                                | *               |                   | PECC2           | The stipulation is in Article 116. The specific maintenance procedure shall be decided by owner, because the structure of each standby power supply varies widely.  | It is confirmed that the requirement regarding standby power supply is already stipulated in Article 116. Accordingly, no action is required. (Concluded in WG Meeting on Jan. 10, 2013)   |            |  |
| 8   | 5    | Article 123         | Frequency of periodic inspection for electrical equipment is three years in Guideline, which shall be coordinated with that in EVN's regulation.   |                                | *               |                   | ETC2            | Frequency of periodic inspection for electrical equipment will be re-considered.  | No revision is required in Article 123 of the draft GL as "three years" is the maximum interval of the mandatory periodic inspection and EVN's regulation satisfies this requirement. (Concluded in WG Meeting on Jan. 10, 2013)   |            |  |
| 9   | 5    | Article 123         | Regarding Article 123 "Frequency of periodic inspection", Table 123-1 is not shown in Guideline.   |                                | *               |                   | ETC2            | Table 123-1 is shown only in the article of Technical Regulation, and a layout of Guideline will be revised.  | Table 123-1 will be shown also in the draft GL. (Concluded in WG Meeting on Jan. 10, 2013)   |            |  |
| 10  | 5    | -                   | It is desirable that detailed test methods, classification patterns and judgment criteria are added to articles of Guidelines.   |                                | *               |                   | Tuyen Quang HPP | Guidelines are not operation and maintenance manuals, and not so many items can be added to them. However, JICA Project Team will confirm comments and reply to them.   | JICA Team may add some information regarding inspection and test in the final draft GL in a practical and reasonable manner. (Concluded in WG Meeting on Jan. 10, 2013)  |            |  |

**3. Comments in 3rd Workshop on draft Guideline Vol.5 (Hydropower Part)**

*(Prepared on 10/1/2013)*

| No. | Vol. | Article & Paragraph | Comment   | Proposed Solution for Revision | Classification  |                   | Unit            | Result of Review by JICA side   | Conclusion  |
|-----|------|---------------------|---|--------------------------------|-----------------|-------------------|-----------------|---|---|
|     |      |                     |   |                                | Technical issue | Translation issue |                 | Proposed Solution for Revision  | Final Solution  |
| 11  | 5    | -                   | It is desirable that Technical Regulations should be suited to the present situation of electrical equipment in Vietnam because regulations in other developed countries cannot always be adopted to electrical equipment in Vietnam. |                                | *               |                   | Tuyen Quang HPP | The JICA Project Team has researched staff's ideas in hydropower plants to adapt them to Technical Regulations and Guidelines by site investigations and baseline survey though the team could not collect the whole data on the number and specifications of test devices. | No particular action is required as the JICA Project Team prepared the draft TR and GL taking into consideration the present situation in Vietnam.<br>(The final decision regarding the contents of TR and GL to be promulgated will be made by Vietnamese side.)<br>(Concluded in WG Meeting on Jan. 10, 2013) |

## **Appendix-7.2**

### **Conclusion Table of Comments on Guidelines (after Progress Report No.2)**

#### **2. Thermal Power Group**

1. Technical Comment Table on Final draft of Guideline (General) (Thermal Power Group)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility | Ver. |
|-----|------|---------------------|---|--|-----------------|-------------------|--|--|----------------|------|
|     |      |                     | Comment   | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                |      |
| 1   | —    | General             | In the draft guidelines use the style "command" or "mandatory" must meet / implement (with the use of common English words carry such mandatory "must", "Shall"), like the style used in the bidding documents provided by investor.  | The guidelines for regulations need to according to the "guide document" criteria and should be open, not mandatory of option, provide the ways for owner apply to meets the regulations.  | ×               | ×                 | In principle, "shall" is applied to those which is legally enforceable, "must" is applied to those which is compliance to the general rule.  | Guidelines will be reviewed according to the principle.                            | JICA           | 2    |
| 2   | —    | General             | In the draft, have a lot of content to mention or reference to the use of standards, guidelines and regulations. . . of Japan (especially common for JIS material related to material of manufacturing, technical specification of mechanical parts). The reference material of other countries is needed. However, now and in the coming years in Vietnam, the source of design, manufacture, supply electrical equipment is very multiiform, we can say that from many countries around the world .   | The draft guidelines need to reference and use the content standards / guidelines in electrical engineering has been standardized internationally (such as ISO, IEC) as the first priority, then to reference and use the standards / guidelines of other countries have a high level of science and technology, has been recognized as the United States, Germany, UK, Japan etc. ... but to note that must conform to the conditions and circumstances of Vietnam. | ×               |                   | Selection of reference standards is left up to JICA. We never force JIS and only introduce as one of prudent international standard which has interoperability with international standard and have experience. It is the selection of Owner which standard to be referred. The research, evaluation and introduction of international standards to TCVN is responsible for the standard committee of Vietnam rather than JICA. JICA never introduce international standards which is not familiar to us such as Russis, China and France. | Guidelines will not modified.<br><b>See Appendix-4.</b>                            | MOIT           | 2    |
| 3   | —    | General             | To standardize or technical regulation of equipment for hydropower plants, thermal power plants must first be classified according to capacity of units, offer the application range; then the standardized will be close and avoid the generic in Vol.4 and Vol.5.   |  | ×               |                   | The difference between the mandatory regulation, administration manual, voluntary standard and guideline and roles of them have not realized by Vietnam side. It is no need to classify by capacity, since requirement for safety is not different by capacity.  | Guidelines will not modified.<br><b>See Appendix-3.</b><br><b>See Appendix-10.</b> | MOIT           | 2    |
| 4   | —    | General             | In each article of the regulations are framed content presentation purposes the requirements of title; the follow section presents instructions on how to meet the criteria in the frame, but some articles in Volume 4 & 5 do not meet expectations. It is still in generic, not specific, the lack of regularization.   |  | ×               |                   | The difference between the mandatory regulation, administration manual, voluntary standard and guideline and roles of them have not realized by Vietnam side. JICA request the Vietnamese side to provide with more specific information .   | Guidelines will not modified.<br><b>See Appendix-3.</b>                            | MOIT           | 2    |
| 5   | —    | General             | Considering that edit some contents of new technologies such as wind power plant, GIS equipment, underground cable system 110 ÷ 500 kV, HVDC systems, ... or the specific provisions of the super-thermal conductor, composite insulator, contamination partition to select devices and insulating or technology equipment in thermal power plants, hydropower, such as technical standards on electrical dust filter, bag dust filter, equipment prevent roof of coal silo, magnetic separation equipment, the detailed requirements on the prevention of explosions in coal silo, fine coal tank, coal mill ... |  | ×               |                   | JICA request the Vietnamese side to provide with more specific information .   | Guidelines will not modified.<br><b>See Appendix-2.</b><br><b>See Appendix-3.</b>  | MOIT           | 3    |
| 6   | —    | General             | The Guidelines, provisions in the Guideline is that very carefully but it seems not required (technical regulations for mechanical transporting equipment - coal fuel system may coincide with the provisions issued by equipment registrar agency, the technical parameters of welding materials ...) but some of the provisions are very vague, leading to difficulties when applied  |  | ×               |                   | JICA request the Vietnamese side to provide with more specific information. The term "application of the guideline" is not appropriate. Guideline is any voluntary guide which shows examples of requirement to be prescribed in the purchase specification or safety matters to be prescribed in the administration manual rather than the bylaws technical regulations.  | Guidelines will not modified.  | MOIT           | 3    |



1. Technical Comment Table on Final draft of Guideline (General) (Thermal Power Group)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility | Ver. |
|-----|------|---------------------|--|---|-----------------|-------------------|--|--|----------------|------|
|     |      |                     | Comment  | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                |      |
| 7   | —    | General             |  | Guideline includes a section of detailed explaining about SCADA / EMS while the controlling in power plant is a very important part but not in the Guideline. Suggest to add contents on power plant control in technical regulations and Guideline.  | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1.        | MOIT           | 4    |
| 8   | —    | General             | Suggest to consult and consider that can be included in the Guideline the following principles for the control system in power plant (these principles have been applied in a number of projects): | (1) High overall system reliability and availability. (2) Safe operation for personnel and equipment (3) Operation of the equipment under all specified conditions (run-up, normal operation, disturbance, emergency, run-backs, run-down, maintenance, and idle) (4) Redundancies shall be provided so that the failure of a single component shall not contribute to abnormal or unsafe conditions, or shorten the life time of the plant. (5) The malfunctions of single critical components or loss of power supply shall not lead to a trip or shut down of a unit. It shall be alarmed and automatically covered by the redundant device or system. Any other major malfunction shall lead to fail-safe conditions only and be alarmed. | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | <b>Guidelines will not be modified.</b><br>See Appendix-1. | MOIT           | 4    |
| 9   | —    | General             |  | (6) The system is to provide actual, accurate, and reliable information of the process to the operators, maintenance staff, engineering staff, and management to allow decisions to be made and actions to be taken to ensure safe, reliable, and efficient operation of all equipment. (7) Operators' interface shall be the HMI in general. One integrated HMI system is used for both UCMS and SCMS. It shall be based on the graphics database of HMI and the information system. It allows controlling and monitoring all plant systems from the PCR. For some specific systems only monitoring is required.   | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1.        | MOIT           | 4    |
| 10  | —    | General             |  | (8) The ICMS shall have a hierarchical control structure. It is configured to provide a high level of plant automation with the ability for remote 10 manual control when required. At any time local manual control must be possible when permission is given by the operator: (a) with protection activated for testing of equipment (b) without protection for purely maintenance purposes (9) The ICMS shall provide general and individual modulating control and sequence control functions.  | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1.        | MOIT           | 4    |
| 11  | —    | General             |  | (10) The system shall provide: (a) graphical process display on HMI, (b) special dedicated control displays on HMI, (c) process data acquisition, (d) process data storage, retrieval, display, and maintenance, (e) alarm handling, (f) process and event history reporting (e.g. monthly report, alarms history, etc.) (g) specific displays for its own maintenance  | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1.        | MOIT           | 4    |

1. Technical Comment Table on Final draft of Guideline (General) (Thermal Power Group)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility | Ver. |
|-----|------|---------------------|--|--|-----------------|-------------------|--|---|----------------|------|
|     |      |                     | Comment                                | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution                                      |                |      |
| 12  | —    | General             |  | (11) It shall be possible to do remote maintenance on the ICMS from the respective engineering workstations located in the engineer's/programmer's room. Remote maintenance from Manufacturer's or Contractor's facilities shall be possible only after a definitive(individual) permission is given by the engineer/management. The physical link to the Internet or telephone line shall be designed as easily removable, i.e. without tools. The existence of a closed link shall be alarmed. (12) An operator shall be able to place a virtual "isolated/permit to work/danger" markers (tags) and text on the HMI on all drive and valve faceplates and other equipment. (13) The protection system for boiler, turbine, major motor drives, and all critical trip inputs and outputs shall have redundancy of hardware. (14) Each HMI operator workstation shall work independently from the others that no failure shall deprive the operation of more than one console. (15) It shall be possible to define a restricted work area for every OWS to avoid cross-unit operations. | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1. | MOIT           | 4    |
| 13  | —    | General             |  | (16) It shall not be possible to introduce alien software by unauthorized person. The ICMS shall be able to detect and report the existence of any alien software or malware. (17) Sequence of Events (SOE) recordings shall allow easy trouble shooting and reconstruction of a sequence of operation events.   | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1. | MOIT           | 4    |
| 14  | —    | General             |  | The control system will be immune to electro-magnetic interference and electrical surges as per international standards. All components in the distributed control system including the network cable, communication controllers, local controllers, group controllers, power supplies and operator stations will be provided in redundancy and arranged to operate in parallel-running mode. If parallel-running mode is not possible, duty / standby mode is acceptable. Changeover between the duty and standby modules will be automatic upon detection of failure of the duty module or manually by the operator. The change over will be bumpless and will not cause any disruption to control functions.  | ×               |                   | The review by Vietnamese side is too general and its content has always been described in the guideline which we submitted this July. Therefore, the issue is not clarified. Moreover, the principle is described in Article 12-2 of the technical regulation. | Guidelines will not be modified.<br>See Appendix-1. | MOIT           | 4    |

2. Technical Comment Table on Final draft of Guideline Vol.2

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph      | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility | Ver. |
|-----|------|--------------------------|---|--|-----------------|-------------------|--|--|----------------|------|
|     |      |                          | Comment   | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                |      |
| 1   | 2    | Article 25-1 Section 1.2 | Translation of Vietnamese version: "put a lot of water is acceptable if boiler has function to shut-off fuel automatically when the water level reaches low level of the boiler. However, the boiler using solid fuel residues harm the boiler must be eliminated"?! The English version are: "A set of feed-water supply equipment is acceptable if the boiler has the function to shut-off fuel automatically when the water level reaches to the safety low water level of boiler. However, the boiler which use solid fuel and may have the residual heat damaging to boiler must be excluded"  | Correct translation into Vietnamese must be: "A set of feed-water supply equipment is acceptable if the boiler has the function to shut-off fuel automatically when the water level reaches to the safety low water level of boiler. However, the boiler which use solid fuel and may have the residual heat damaging to boiler must be excluded (after stopped fuel supply from the outside)" |                 | ×                 | It has been answered "it has been already described, it must be read carefully". The general comments is not necessary without perusal.  | Vietnamese side agreed the content what this Article says. JICA will review English expressions of this Article.<br><b>See Appendix-3.</b> | JICA           | 2    |
| 2   | 2    | Article 25-2             | Content in the English version should also review because to ensure safe operation of boilers, the boilers used in power industry today have at least 2 feed water pumps, and often must have the necessary reserve, such as 3x50% or 2x100%  |  | ×               |                   | It has been answered "it has been already described, it must be read carefully". The general comments is not necessary without perusal.  | Vietnamese side agreed the content what this Article says. JICA will review English expressions of this Article.<br><b>See Appendix-3.</b> | JICA           | 2    |
| 3   | 2    | Article 219 - Table 10   | The legislation documents mentioned in the draft has expired implementation and were replaced by:<br>(i) On details and guides implementation some articles of the Law on Environmental Protection (the Decree No. 80/2006/ND-CP, 21/2008/ND-CP & 29/2011/ND-CP) ;<br>(ii) On the handling of law violations in the domain of environmental protection (Decree No. 117/2009/ND-CP);<br>(iii) On details of some articles of Decree 29/2011/ND-CP dated 18/4/2011 of the Government on providing strategic environmental assessment, environmental impact assessment and environmental protection commitment(Circular No. 26/2011/TT-BTNMT). |  | ×               |                   | It cannot be understood the comment that the limit of steam purity is regulated by the environmental row and regulation. It must be considered. This is the guideline for feed-water and boiler water. | Guideline will not be modified.<br><b>See Appendix-10.</b>   | —              | 2    |
| 4   | 2    | Article 231              | According to Paragraph 4, Article 1 of Decree No. 81/2009/ND-CP dated 12/10/2009 of the Government on amending and supplementing some articles of Decree No. 106/2005/ND-CP, provision:<br>"The electric field intensity $\leq 5$ kV/m at any point outside house home, distance to ground one meter and $\leq 1$ kV/m at any point inside house, distance to ground one meter"<br>Please see the Paragraph 10, Article 231 of this regulation for uniform electric field intensity between the current regulations.  |  | ×               |                   | The guideline will be revised according to the technical regulation.   | The guideline has been revised according to the technical regulation.  | JICA           | 2    |

2. Technical Comment Table on Final draft of Guideline Vol.2

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility  | Ver. |   |
|-----|------|---------------------|--|-------------------------------------|-----------------|-------------------|--------------------------------|---|---|------|---|
|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution  |   |      |   |
| 5   | 2    | Article 254         | <p>Base on Code of electrical facilities together with Decision No. 19/2006/QĐ-BCN dated 07/11/2006 of Ministry of Industry (now the Ministry of Industry and Trade) promulgating the Codes on electrical facilities, Article IV.2.52 provision:<br/>                     Must apply steam protection to against inside machine failure by reason of gas emissions, prevent lower oil level and higher oil pressure for. Transformer with capacity is 6,3 MVA and more.<br/>                     Proposal to uniform the norm capacity, transformer must be equipped to protective equipment to against failure inside the transformer between Code of electrical facilities and draft of this regulation.<br/>                     Proposal to transformer with norm capacity is 6,3 MVA and more must be equipped with protective equipment to against failure inside the transformer as the current Code of electrical facilities</p> |                                     |                 |                   |                                | <p>The guideline will not be revised because the relevant part of the technical regulation is not revised.<br/>                     Moreover, we cannot understand the meaning of the terms such as MBA, combat level.</p>  | <p>The guideline will be revised according to the discussion on 31/Aug/2012.<br/>                     Moreover, the relevant value of table 29 in the technical regulation should be revised.</p> | JICA | 2 |
| 6   | 2    | General             | <p>The detailed provisions for the technical conditions of the coal transporting equipment with motorized vehicles in the Guideline, it is considered that they are necessary or not because of all mechanical equipment shall comply with the provisions of the mechanical equipment registrar agency. If put into, they are easy to lead to conflict between the investor and the competent authorities of the State. Should only additional require for criteria that registrar agency can not give (eg safety facilities are fitted to prevent fire- explosion, reduce dust emissions ...)</p>   |                                     |                 |                   |                                | <p>Originally, facilities which are regulated by other law and regulation is not subject to the technical regulation of generation facility. However, there was the demand to subject of fuel facility to this project depending on the desire from Vietnam side. Accordingly, vehicles, railway and mining machines are added as potentially dangerous equipments. It no necessary to refer the guidelines, if construction of body, safety equipment, safety usage are secured by other low and regulation. Guideline is only for guidance, are not mandatory regulation.</p> | <p>Guideline will not be modified.<br/>                     See Appendix-3.</p>   | —    | 3 |
| 7   | 2    | Article 51-2        | <p>Should clearly stipulate the number of nozzles, spray flow ... for each type of storage, coal pile to avoid the controversy in the process of design, design verification</p>   |                                     |                 |                   |                                | <p>It is impossible to explain in the limited space of guideline how to design a number of spray nozzles. It is the selection by Owner against the requirement of technical regulation "Do not cause fire". It may conform to the mandatory low and regulation for fire fighting equipment, etc., if there is. The guideline has been introduced water spray equipment as a alternative.</p>  | <p>Guideline will not be modified.<br/>                     See Appendix-1.</p>   | —    | 3 |
| 8   | 2    | Article 52-4        | <p>Contains coal in coal silo need to shall add the requirements of explosion-proof of silo, measure silo level and add details of the anti-clogging forms of silo to service for better design</p>  |                                     |                 |                   |                                | <p>The basic measure is to prevent the accumulation in the range of combustible gas or dust. Essentially, the guideline does not mention how to design the facility. Individual design content must be confirmed to manufacturer, since JICA expert is not equipment manufacture and supplier.</p>  | <p>Guideline will not be modified.<br/>                     See Appendix-1.</p>   | —    | 3 |
| 9   | 2    | Article 54          | <p>Should clear stipulate to what conveyor type shall pull gravity belt, the installation location</p>   |                                     |                 |                   |                                | <p>Essentially, the guideline does not mention how to design the facility. It must be confirmed to the manufacturer, since JICA expert is not the equipment manufacturer or equipment supplier. Incidentally, it is recommended to refer such a "Conveyor Handbook of Goodyear" or "Conveyor Handbook of Bridgestone".</p>  | <p>Guideline will not be modified.<br/>                     See Appendix-1.</p>   | —    | 3 |

2. Technical Comment Table on Final draft of Guideline Vol.2

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph         | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion  | Responsibility | Ver. |
|-----|------|-----------------------------|---|-------------------------------------|-----------------|-------------------|---|---|----------------|------|
|     |      |                             | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                |      |
| 10  | 2    | Article 58                  | Coal mill: It should give to criterias, the specific technical requirements of the installation, acceptance, operation, ... coal mill and auxiliary systems for coal mill   |                                     |                 | ×                 | Essentially, the guideline does not mention how to design the facility. It must be confirmed to the manufacturer, since JICA expert is not the equipment manufacturer or equipment supplier. Individual design content must be confirmed to manufacturer.   | Guideline will not be modified.<br><b>See Appendix-1.</b> | —              | 3    |
| 11  | 2    | Handling Guideline coal ash | The design requirements are very vague, not using much in design work, there are no clear criteria for selection. The slag parameters at bottom of the furnace, fly ash is not representative of commonly used plants in Vietnam. Need to add other parameters to better support in the design work |                                     |                 | ×                 | Essentially, the guideline does not mention how to design the facility. It must be confirmed to the manufacturer, since JICA expert is not the equipment manufacturer or equipment supplier. Individual design content must be confirmed to manufacturer. Technical regulation prescribe "Reuse ash as beneficial resource rather than waste", "Prevent environmental pollution due to un-useful material", guideline just introduces how to treat them.            | Guideline will not be modified.<br><b>See Appendix-1.</b> | —              | 3    |
| 12  | 2    | Handling Guideline coal ash | Table 15. Standards of wastewater effluents from ash lake is take by what is standard ?, does it consistent with standards of Vietnam when design ? Should put this part into Volume 2 - Environment Facility is more suitable  |                                     |                 | ×                 | Table-15 introduce the excess emission regulation from the ash pond to sea water in Japan. It is no need to mention, if there is already the mandatory regulation has been established in Vietnam.  | Table-15 must be deleted.                                 | JICA           | 3    |
| 13  | 2    | Handling Guideline coal ash | There are not specific standards, instructions for the design on dry slag dump, wet slag dump (wet dump using salt water, freshwater ...)   |                                     |                 | ×                 | We have introduced as a matter that should be noted as an environmental measure, though it has less weight of facility. It seems that there is no standard of slag. Any individual regulations and standards must be considered Vietnam side.   | Guideline will not be modified.<br><b>See Appendix-1.</b> | —              | 3    |
| 14  | 2    | Guideline of Welding        | Proposal does not give too many detail standard on base metal, weld metal. These standards depends on various contractors and by different countries  |                                     |                 | ×                 | We never state the detail of welding base meet or welding rod in the guideline. Guideline can only show the voluntary standards which Owner need to check by themselves as a guideline. In general, Owner may specify the voluntary standard which should be conform to.  | Guideline will not be modified.<br><b>See Appendix-1.</b> | —              | 3    |
| 15  | 2    | Guideline of Welding        | The list of priority standards in order to using shall according to odering TCVN - ISO - other State standard. The focus of this chapter using Japanese standards too much, giving other countries standard very few lead to limit when choice.   |                                     |                 | ×                 | TCVN is applicable as first priority voluntary welding standard and also proven international standards are applicable. It is natural to introduce Japanese standards which are proven and familiar standard, since Japanese JICA expert introduce. We never introduce standards of Russia, China, France and the like which is not familiar. It must be researched, evaluated and assessed whether they are worth to be used by the Vietnamese standard committee. | Guideline will not be modified.<br><b>See Appendix-4.</b> | —              | 3    |
| 16  | 2    | GT Table 45                 | This standard specifies the method to detect corrosion of silver of aviation turbine fuel   |                                     |                 |                   | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —              | 4    |
| 17  | 2    | GT Table 45                 | This standard establishes methods used to measure and evaluate the dispersion of the exhaust gas...   |                                     |                 |                   | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —              | 4    |

2. Technical Comment Table on Final draft of Guideline Vol.2

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility  | Ver. |   |
|-----|------|---------------------|---|---|-----------------|-------------------|--------------------------------|---|---|------|---|
|     |      |                     | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution  |   |      |   |
| 18  | 2    | GT Table 45         | This standard specifies quality criteria of fuel for jet engine...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 19  | 2    | GT Table 45         | This standard applies to three phases electrical mechnes of turbine which have rated output is ...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 20  | 2    | GT Table 45         | This standard establishes monitoring and observational programs and requirements for the selection ...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 21  | 2    | GT Table 45         | This method applies to portable quickly gauge which use on-site ...   |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 22  | 2    | GT Table 45         | This standard specifies the method to detect corrosion tendency of silver of the fuel ...   |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 23  | 2    | GT Table 45         | This standard specifies quality criteria of fuel for jet engine...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 24  | 2    | GT Table 45         | This standard specifies the methods to determine concentration of naphhtalen, acenaphien...   |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 25  | 2    | GT Table 45         | This standard specifies the methods to determine concentration of total acid ...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 26  | 2    | GT Table 45         | This standard specifies the methods to determine concentration of sulfur mercaptan ...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 27  | 2    | GT Table 45         | This standard specifies quality criteria of fuel for jet engine of turbin ...   |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 28  | 2    | GT Table 45         | This standard specifies the methods to determine hight of flame without smoke ...   |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 29  | 2    | GT Table 45         | This standard specifies rules to evaluates vibration of prime motors ...  |   |                 |                   | ×                              | JICA expert is not familiar with TCVN, the reference TCVN should be organized by Vietnam side.  | Guideline will not be modified.<br><b>See Appendix-4.</b> | —    | 4 |
| 30  | 2    |                     | Table 245-1-1 Measurement equipment for Boiler (mandatory), Table 245-1-2 Measurement equipment for Boiler (recommendation), Table 246 -1-1 Measurement equipment for Steam turbine (mandatory), Table 246-1-2 Measurement equipment for Steam turbine (recommendation), Table 247-1-1 Measurement equipment for Gas turbine (mandatory), Table 247 -1-2 Measurement equipment for Gas turbine (recommendation) | Required to match the contents of the corresponding tables in the Guideline of "steam turbine", "gas turbine", "boiler" and Regulation. |                 |                   | ×                              | The minimum monitoring items is prescribed in Vol.2 and the measuring equipment to equip in order to achieve such requirements are recommended in the guideline. It is depending on the selection of Owner whether to equip those that are presented in the guidelines through discussion with manufacturer. Although it is thought there may be a slight difference in electrical version and mechanical version, it is not necessary to match them, since it is a sample. | Guideline will not be modified.<br><b>See Appendix-9.</b> | —    | 4 |

2. Technical Comment Table on Final draft of Guideline Vol.2

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph                                       | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility  | Ver. |   |
|-----|------|---|---|---|-----------------|-------------------|--------------------------------|--|---|------|---|
|     |      |   | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |   |      |   |
| 31  | 2    |   | Table 245-1-1 Measurement equipment for Boiler (mandatory)  | Need to add monitoring parameters on metal temperature of superheater pipes; exhaust gas temperature, metal temperature of higher half of the steam drum; metal temperature of lower half steam drum; feed water temperature to monitoring at startup furnace and in operation. Steam flow and feed water flow shall be mandatory monitored.  |                 | ×                 |                                | The minimum monitoring items are prescribed in Vol.2 and the measuring equipments ,which are recommended to be equipped in order to achieve such requirements, are recommended in the guideline. It depends on the selection of Owner whether to equip those that are presented in the guidelines. | Guideline will not be modified.<br><b>See Appendix-9.</b>                             | —    | 4 |
| 32  | 2    |   | Table 246-1-1, Measurement equipment for steam turbine (mandatory)  | Should add the following monitoring parameters: active power and reactive power; steam pressure after the first stage; relative expansion of rotor and stator; absolute expansion of turbine cylinder; turbine shaft displacement ; turbine shaft run-out ; temperature and pressure of lubricant oil inlet turbine; control oil temperature and pressure ; lubricant and control oil tank level ; thrust-strip of thrust bearing of turbine; metal temperature of higher half and lower half of high-pressure and intermediate-pressure cylinder; exhaust steam temperature of turbine (to serve turbine startup processing); pressures and temperatures inlet the low-pressure and intermediate-pressure turbine; seal steam pressure; vacuum of seal cavity of negative-pressure turbine shaft; salt concentration of the condensate. If the deaerator, heaters and condenser are vided inside the turbine clusters should also monitoring: condenser water levels; circulating water temperature inlet and outlet the condenser; the heater water levels; pressure of heaters; deaerator water level; deaerator pressure. |                 | ×                 |                                | The minimum monitoring items are prescribed in Vol.2 and the measuring equipments ,which are recommended to be equipped in order to achieve such requirements, are recommended in the guideline. It depends on the selection of Owner whether to equip those that are presented in the guidelines. | Guideline will not be modified.<br><b>See Appendix-9.</b>                             | —    | 4 |
| 33  | 2    |   | Table 247-1-1, Measurement equipment for gas turbine (mandatory)  | Should add the following monitoring parameters: active power and reactive power; turbine shaft run-out ; temperature of air inlet compressor; temperature and level of lubricant oil; pressure and level of control oil; measuring points of exhaust gas, fuel temperature and pressure.  |                 | ×                 |                                | The minimum monitoring items are prescribed in Vol.2 and the measuring equipments ,which are recommended to be equipped in order to achieve such requirements, are recommended in the guideline. It depends on the selection of Owner whether to equip those that are presented in the guidelines. | Guideline will not be modified.<br><b>See Appendix-9.</b>                             | —    | 4 |
| 34  | 2    | Env. Chapter 5 (Reference TCVN)/Table 34 (Reference TCVN) | TCVN 5318 : 2001 Machine tools. Determination of perpendicularity of the directions of two displacements. Test methods: -TCVN 5400 : 1991 Welded joints. General requirements of sampling for mechanical test; -TCVN 5402 : 2010 Welded joints. Blow-bending test method; -TCVN-7473 : 2005 Welding coordination. Tasks and responsibilities; -TCVN-7506-4 2005 Quality requirements for welding. Fusion welding of metallic materials. Part 4: Elementary quality requirements; -TCVN 7506-1 2005 Quality requirements for welding. Fusion welding of metallic materials. Part 1: Guidelines for selection and use; -TCVN 7506-2 2005 Quality requirements for welding. Fusion welding of metallic materials. Part 2: Comprehensive quality; -TCVN 7506-3 2005 Quality requirements for welding. Fusion welding of metallic materials. Part 2: Standard quality requirements | revise to: "TCVN 5318:2001 Mobile offshore units. Rules for classification and construction. Welding: -TCVN 5400 : 1991 Weld. General requirements of sampling for mechanical test; -TCVN 5402 : 2010 Destructive tests on welds in metallic materials. Impact test. Test specimen location, notch orientation and examination; -TCVN-7473 : 2011 Welding coordination. Tasks and responsibilities; -TCVN-7506-4 2011 Quality requirements for fusion welding of metallic materials. Part 4: Elementary quality requirements; -TCVN 7506-1:2011 Quality requirements for fusion welding of metallic materials. Part 1: Criteria for the selection of the appropriate level of quality requirements; -TCVN 7506-2 2011 Quality requirements for fusion welding of metallic materials. Part 2: Comprehensive quality requirements; -TCVN 7506-3 2011 Quality requirements for fusion welding of metallic materials. Part 3: Standard quality requirements."   |                 |                   | ×                              | The policy to refer law and regulation legislated by other agency must be decided by Vietnam side. Old law and regulation must be replaced by Vietnam side, if necessary, since they know well the current situation.  | Guideline will not be corrected.<br><b>See Appendix-4.</b><br><b>See Appendix-10.</b> | MOIT | 4 |

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(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side   | Conclusion  | Responsibility | Ver. |
|-----|------|--|--|---|-----------------|-------------------|---|---|----------------|------|
|     |      |  | Comment  | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                |      |
| 35  | 2    | Env. Chapter 2 (Each Items of Guideline)/Article 219 (Laws and regulation related to environment, page 8/99) | Currently, some of the environmental standards enacted in 1995 have been revised and the rest of has been replaced with Vietnam National Technical Regulation (QCVN-05: 2009/BTNMT, etc.). | Revise to: "Currently, some of the environmental standards enacted in 1995 have been revised and the rest of has been replaced with Vietnam National Technical Regulation (QCVN-24: 2011/BTNMT, etc.)." |                 | ×                 | The policy to refer law and regulation legislated by other agency must be decided by Vietnam side. Old law and regulation must be replaced by Vietnam side, if necessary, since they know well the current situation. | Guideline will not be corrected.<br>See Appendix-4.<br>See Appendix-10.<br>See Appendix-11. | MOIT           | 4    |
| 36  | 2    | Env. Table 15 (National technical regulation on industrial wastewater, page 45/99)                           | BODs (at 200C)   | Revise to: "BOD5 (at 200C)"   | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 37  | 2    | Env. Table 20 (Water quality regulation for surface water QCVN 08/2008/BTNMT, page 49/99)                    | BOD (20oC)   | Revise to: "BOD5 (at 200C)"   | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 38  | 2    | Env. Article222-1  | Ammonia (NH4)  | Ammonia (NH+4) (calculated by Nitrogen)   | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 39  | 2    | Env. Article222-1  | Chloride (Cl)  | Chloride (Cl-)  | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 40  | 2    | Env. Article222-1  | Fluorine (F)   | Fluorine (F-)   | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 41  | 2    | Env. Article222-1  | Nitrite (NO2)  | Nitrite (NO--2) (calculated by Nitrogen)  | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |
| 42  | 2    | Env. Article222-1  | Chrome (Cr3-)  | Chrome (Cr3+)   | ×               |                   | Guideline will be corrected according to the comment.   | Guideline has been corrected.<br>See Appendix-11.   | JICA<br>MOIT   | 4    |



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|-----|------|--|--|---|-----------------|-------------------|---|--|----------------|------|
|     |      |  | Comment                                | Proposed Solution for Revision          | Technical issue | Translation issue | Proposed Solution for Revision                        | Final Solution                                       |                |      |
| 43  | 2    | Env. Article222-1  | Chrome (Cr6-)                          | Chrome (Cr6+)                           | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 44  | 2    | Env. Table 21 (National Technical Regulation on Coastal Water Quality QCVN 10/2008/BRN MT, page 51/99) | Ph                                     | pH                                      |                 | ×                 | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 45  | 2    | Env. Article222-1  | Ammonia (NH4)                          | Ammonia (NH+4) (calculated by Nitrogen) | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 46  | 2    | Env. Article222-1  | Fluorine (F)                           | Fluorine (F-)                           | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 47  | 2    | Env. Article222-1  | Cyanide (CN)                           | Cyanide (CN-)                           | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 48  | 2    | Env. Article222-1  | Chrome (Cr3-)                          | Chrome (Cr3+)                           | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 49  | 2    | Env. Article222-1  | Chrome (Cr6-)                          | Chrome (Cr6+)                           | ×               |                   | Guideline will be corrected according to the comment. | Guideline has been corrected.<br>See Appendix-11.    | JICA MOIT      | 4    |
| 50  | 2    | Env. Article222-1 Herbicide chemical   | µg/ ℓ                                  | mg/l                                    | ×               | ×                 | The unit is correct.                                  | Guideline will not be corrected.<br>See Appendix-11. | —              | 4    |
| 51  | 2    | Env. Article222-1 Herbicide chemical   | µg/ ℓ                                  | mg/l                                    | ×               | ×                 | The unit is correct.                                  | Guideline will not be corrected.<br>See Appendix-11. | —              | 4    |
| 52  | 2    | Env. Article222-1 Herbicide chemical   | µg/ ℓ                                  | mg/l                                    | ×               | ×                 | The unit is correct.                                  | Guideline will not be corrected.<br>See Appendix-11. | —              | 4    |

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| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility                        | Ver. |   |
|-----|------|--|---|--|-----------------|-------------------|--------------------------------|---|---------------------------------------|------|---|
|     |      |  | Comment   | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution  |                                       |      |   |
| 53  | 2    | Env. Table 34 (Reference TCVN, page 93/99)                           |   | Suggest to translate into English  |                 |                   | ×                              | We are not involved the translation issues. It must be considered in the process of promulgation. | Guideline will not be modified.       | —    | 4 |
| 54  | 2    | Coal Fuel (page 2)   | DGS, GS, MPS, VS  | Suggest to note abbreviations  | ×               | ×                 |                                | JICA have tried to confirm the meaning, however, we can not find.                                 | The acronym table will be left blank. | —    | 4 |
| 55  | 2    | Coal Fuel Nature of coal (page 5)                                    | Analysis and testing method are defined by JIS M8812.   | Suggest to add: "Analysis and testing method are defined by JIS M8812 or any better standards"   | ×               |                   |                                | Guideline will be corrected according to the comment.   | Guideline has been corrected.         | JICA | 4 |
| 56  | 2    | Coal Fuel Article 43-1-1.4 Type of coal transportation (page 7)      | Vietnam is the coal producing country and the bituminous coal, sub-bituminous coal or dust coal... However, the large-scale power plants located in coastal areas will be necessary due to soaring electricity demand, it might be necessary to import foreign coal. Therefore, it is believed that following transportation method might be applied in future.<br>1) Located adjacent to the coal field area and transport mainly by conveyor<br>2) Located inland and transport by railway or vehicle<br>3) Located inland and transport mainly by domestic vessel<br>4) Located coastal area and transport by large ocean vessel<br>5) Imported to the coastal coal center and distribute to each PS located inland by domestic vessel , railway or vehicle. | Suggest to revise into: "... anthracite dust coal, bituminous coal and sub-bituminous coal ... However, due to soaring electricity demand, the large-scale power plants located in coastal areas will be necessary to import foreign coal. Therefore, following transportation methods might be applied. 1) Coal would be transported mainly by conveyors for coal fired power plant located adjacent to the coal field area. 2) Coal would be transported by railway or vehicle or domestic vessel for coal fired power plant located inland. 3) Coal would be transported by large ocean vessel for coal fired power plant located in coastal area. 4) Coal would be imported to the coastal coal center and distributed to power plants located inland by domestic vessel or railway or vehicle." | ×               |                   |                                | Guideline will be corrected according to the comment.   | Guideline has been corrected.         | JICA | 4 |
| 57  | 2    | Coal Fuel Article 43-1-2. Fig-1 (page 9)                             | "Na Dung"; "Quang Nin"; "Coal Conventional Power Plant"; "Fluidized Bed Combustion Power Plant"   | Suggest to revise into: "Na Duong"; "Quang Ninh"; "Conventional Pulverized Coal - Fired Power Plant"; "Fluidized Bed Coal - Fired Power Plant".  | ×               | ×                 |                                | Guideline will be corrected according to the comment.   | Guideline has been corrected.         | JICA | 4 |
| 58  | 2    | Coal Fuel Article 43-1-3. Outline of coal handling facility (page 9) | The 1,000~20,000DWT class vessel is used for the domestic coal carrier, the at least 10,000DWT class vessel is used for the ocean-going vessels and recently 150,000DWT class vessel is used for the ocean-going vessels.   | To reduce time and transportation costs for imported coal from overseas, at least should be 35,000DWT class vessel is used. So that, suggest to revise to: "The 1,000~20,000DWT class vessel is used for the domestic coal carrier, the at least 35,000DWT class vessel is used for the ocean-going vessels and recently 150,000DWT class vessel is used for the ocean-going vessels.  | ×               |                   |                                | Guideline will be corrected according to the comment.   | Guideline has been corrected.         | JICA | 4 |
| 59  | 2    | Coal Fuel Article 45-2 (page 16)                                     | ...That efficiency of continuous unloader is 80% and more whereas it was approximately 60% in a conventional grab type unloader,...   | Suggest to revise into: "...That efficiency of continuous unloader is 65% (through the ship) and more whereas it was approximately 45% and more in a conventional grab type unloader,..."  | ×               |                   |                                | The proposed efficiency from Vietnam side is too low.   | Guideline will not be corrected.      | —    | 4 |

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|-----|------|--|---|---|-----------------|-------------------|--|---|----------------|------|
|     |      |  | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                |      |
| 60  | 2    | Coal Fuel Article 45-2&45-3 (page 16-17)                                     | "Article 45-2. Requirement for unloader;" và "Article 45-3. Requirement for bucket crane"   | To cover unloaders, suggest to revise into: "Article 45-2. Requirement for continuous unloaders." and "Article 45-2. Requirement for intermittent unloaders." |                 |                   | Guideline will be corrected according to the comment.  | Guideline has been corrected.   | JICA           | 4    |
| 61  | 2    | Coal Fuel Article 46-1. Locomotive and orbit (page 20)                       | In the hand brake, the braking leverage must be 1,200 or less   | Suggest to clarify unit of these numbers  |                 |                   | Guideline will be corrected according to the comment.  | "times" has been supplemented to guideline.                                 | JICA           | 4    |
| 62  | 2    | Coal Fuel Article 47-1. Requirement for vehicle (page 26)                    | The loudness of alarm hone (if more than 2 hones  | Suggest to revise into: The loudness of alarm horn (if more than 2 horns  |                 |                   | Guideline will be corrected according to the comment.  | Guideline has been corrected.   | JICA           | 4    |
| 63  | 2    | Coal Fuel Article 51-5-1 Requirement for outdoor coal storage yard (page 45) | (1) Stacked height must not exceed the proper height, which may be number of m to number of 10m.  | Suggest to review this sentence, incomplete information.  |                 |                   | Guideline will be reconfirmed..  | Guideline has been corrected to "several meters".<br><b>See Appendix-3.</b> | JICA           | 4    |
| 64  | 2    | Coal Fuel Article 51-5-1-(1)-4)  | (4) The internal temperature of coal must be measured on a regular basis to monitor changes in temperature. The maximum temperature inside the coal is said to have about 1m from the inner surface of pile, it is appropriate to monitor and thermometer inserted into this part | How to determine "about 1m from the inner surface of pile? The numbering should be re-formatted   |                 |                   | The deapth will be determined depending on the length of thermometer. It is not clear "re-formatted".  | Guideline will not be corrected.<br><b>See Appendix-3.</b>                  | MOIT           | 4    |
| 65  | 2    | Coal Fuel  |   | How many days is the least capacity of outdoor coal storage yard?   |                 |                   | The storage capacity vary depending on the fund, land which can be secured, time to procure, transportation method. It must be dicided by owner. It is need less amount of coal storage in the outdoor coal storage yard, if the transportation is conducted by conveyor in the coal field area. | Guideline will not be corrected.<br><b>See Appendix-3.</b>                  | MOIT           | 4    |

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|-----|------|---|---|------------------------------|--------------------------|-----------------------------|--|------------------------------|--------------------------|-----------------------------|-----------------|-------------------|--|----------------------------------|----------------|------|
|     |      |   | Comment   |                              |                          |                             | Proposed Solution for Revision   |                              |                          |                             | Technical issue | Translation issue | Proposed Solution for Revision                                     | Final Solution                   |                |      |
| 66  | 2    | Coal Fuel Article 51-4 (Table-16: Angle of repose of coal, page 44) | Material  | Density (kg/m <sup>3</sup> ) | Angle of repose (degree) | Angle of surcharge (degree) | Material   | Density (kg/m <sup>3</sup> ) | Angle of repose (degree) | Angle of surcharge (degree) |                 |                   | This item will be corrected according to the comment.              | Guideline has been corrected.    | JICA           | 4    |
|     |      |   | Bituminous, broken  | —                            | —                        | 35                          | Anthracite, <15mm  | 900-1100                     | 37                       | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | Anthracite, broken  | —                            | —                        | 35                          | Bituminous, <50mm  | —-800                        | 36-38                    | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | soft  | —                            | —                        | 30                          | Bituminous, run off mine   | 720-880                      | 35                       | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | 150mm diameter size   | 850-900                      |                          | 25                          | Bituminous, slack  | 690-800                      | 37                       | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | run off mine  | 720-880                      | 35                       | 25                          | Lignite, broken  | 720-880                      | —                        | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | slack   | 690-800                      | 37                       | 25                          | pulverized for coking  | 480-590                      | —                        | 10                          |                 |                   |  |                                  |                |      |
|     |      |   | lignite, broken   | 720-880                      | —                        | 25                          | run of oven  | 400-480                      | 30                       | 25                          |                 |                   |  |                                  |                |      |
|     |      |   | hard  | —                            | —                        | 24                          | breeze   | 380-560                      | 30-45                    | 20                          |                 |                   |  |                                  |                |      |
|     |      |   | pulverized for coking   | 480-590                      | —                        | 10                          |  |                              |                          |                             |                 |                   |  |                                  |                |      |
|     |      |   | run of oven   | 400-480                      | 30                       | 25                          |  |                              |                          |                             |                 |                   |  |                                  |                |      |
|     |      |   | breeze  | 380-560                      | 30-45                    | 20                          |  |                              |                          |                             |                 |                   |  |                                  |                |      |
| 67  | 2    | ST Article 29-1, Sub-article 2, table 3 (Reaction Type, page 10)    | The reaction type has 1.5~2.0 times stage numbers compared with the impulse type under same heat supply, because the heat consumption a stage of the reaction type is nearly half of the reaction type. The single-stage reaction turbine does not exist. |                              |                          |                             | Suggest to revise to: "The reaction type has 1.5~2.0 times stage numbers compared with the impulse type under same heat supply, because the heat consumption a stage of the reaction type is nearly half of the impulse type. The single-stage reaction turbine does not exist." |                              |                          |                             | ×               |                   | This item has been corrected according to the request from EVN.    | Guideline has been corrected.    | JICA           | 4    |
| 68  | 2    | ST Article 29-1, Sub-article 3 (page 10)                            | 3. Classification by Type of blade  |                              |                          |                             | Suggest to revise to: "3. Classification by Type of Turbine Stage (blade compound)"  |                              |                          |                             | ×               |                   | This item has been corrected according to the request from EVN.    | Guideline has been corrected.    | JICA           | 4    |
| 69  | 2    | ST Article 29-1, Sub-article 3 (Table 4, Rateau Type, page 10)      | Rateau Type   |                              |                          |                             | Suggest to revise to: "Rateau Type (Pressure compounded stages)"   |                              |                          |                             |                 | ×                 | This item has been supplemented according to the request from EVN. | Guideline has been supplemented. | JICA           | 4    |
| 70  | 2    | ST Article 29-1, Sub-article 3 (Table 4, Rateau Type, page 10)      | A stage is composed by a pair of vanes and a pair of blades. The multistage type would be repeated multiple times. The Rateau type is applied to the multistage turbine overwhelmingly;   |                              |                          |                             | Suggest to add and revise to: "A impulse stage is composed by a pair of vanes and blades. The multistage type would be repeated multiple times. The Rateau type is applied to the multistage turbine overwhelmingly;   |                              |                          |                             |                 | ×                 | This item has been corrected according to the request from EVN.    | Guideline has been corrected.    | JICA           | 4    |

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|-----|------|--|---|---|-----------------|-------------------|---|----------------------------------|----------------|------|
|     |      |  | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution                   |                |      |
| 71  | 2    | ST<br>Article 29-1,<br>Sub-article 3<br>(Table 4,<br>Curtis Type,<br>page 10)  | Curtis type   | Suggest to add: "Curtis type (Velocity compounded stage)"   |                 | ×                 | This item has been supplemented according to the request from EVN.                        | Guideline has been supplemented. | JICA           | 4    |
| 72  | 2    | ST<br>Article 29-1,<br>Sub-article 3<br>(Table 4,<br>Curtis Type,<br>page 10)  | There is the one set of stage which is composed by one row of vane and two rows of blades "blade-vane-blade", or the one set of stages which is composed two vanes and three blades "blade-vane-blade-vane-blade" . | Suggest to add and revise to: "There is the one set of impulse stage which is composed by a stationary nozzle with one row of vane and two rows of blades "blade-vane-blade", or the one set of impulse stages which is composed by the stationary nozzles with many rows of blades and vanes." |                 | ×                 | This item has been supplemented according to the request from EVN.                        | Guideline has been supplemented. | JICA           | 4    |
| 73  | 2    | St<br>Article 29-1,<br>Sub-article 3<br>(Table 4,<br>Persons Type,<br>page 11) | Persons Type  | Suggest to revise to: "Reaction stage type"   |                 | ×                 | This item has been confirmed to modify as the result of meeting with EVN on 8/24.         | Guideline has been corrected.    | JICA           | 4    |
| 74  | 2    | ST<br>Article 29-1,<br>Sub-article 12<br>(Table 12, Type 12,<br>page 19)       | 30.1 MPa (g)  | Suggest to revise to: 24.1 MPa (g)  | ×               |                   | This item has been confirmed no need to modify as the result of meeting with EVN on 8/24. | Guideline will not be modified.  | —              | 4    |
| 75  | 2    | ST<br>Article 31-3-7<br>(Turbine Grand, page 46)                               | Article 31-3-7. Turbine Grand   | Suggest to revise to: Article 31-3-8. Turbine Grand   |                 | ×                 | This item has been corrected according to the request from EVN.                           | Guideline has been corrected.    | JICA           | 4    |
| 76  | 2    | ST<br>Article 31-3-8<br>(Turning Gear, page 48)                                | Article 31-3-8. Turning Gear  | Suggest to revise to: Article 31-3-9. Turning Gear  |                 | ×                 | This item has been corrected according to the request from EVN.                           | Guideline has been corrected.    | JICA           | 4    |
| 77  | 2    | ST<br>Article 31-3-9<br>(Turbine Lubrication Oil, page 49)                     | Article 31-3-9. Turbine Lubrication Oil   | Suggest to revise to: Article 31-3-10. Turbine Lubrication Oil  |                 | ×                 | This item has been corrected according to the request from EVN.                           | Guideline has been corrected.    | JICA           | 4    |

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|-----|------|---|--|--|-----------------|-------------------|--|---------------------------------|----------------|------|
|     |      |   | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution                  |                |      |
| 78  | 2    | ST<br>Article 31-3-10<br>(Lubrication Oil Purifier, page 49)                            | Article 31-3-10. Lubrication Oil Purifier  | Suggest to revise to: Article 31-3-11. Lubrication Oil Purifier                                    |                 | ×                 | This item has been corrected according to the request from EVN.  | Guideline has been corrected.   | JICA           | 4    |
| 79  | 2    | ST<br>Article 31-3-11<br>(Vapor Extraction System for Turbine Lubrication Oil, page 49) | Article 31-3-11. Vapor Extraction System for Turbine Lubrication Oil   | Suggest to revise to: Article 31-3-12. Vapor Extraction System for Turbine Lubrication Oil         |                 | ×                 | This item has been corrected according to the request from EVN.  | Guideline has been corrected.   | JICA           | 4    |
| 80  | 2    | Article 213-1-3.2   | The terms for boiler water<br>This item, the explain about pH of purity of water: $[H^+]=10^{-7}$ , $[OH^-]=10^{-7}$ g-ion/L is incorrect if so pH of pure water will as : $pH=-\log[H^+]=-\log 10^{-7}=7$ | Need to revise: $[H^+]=10^{-7}$ , $[OH^-]=10^{-7}$ g-ion/L then $pH=-\log 10^{-7}=7$               | ×               |                   | "10 - 7" in English version. This is the wrong translation into Vietnamese . Vietnamese version must be corrected in the process of promulgation.  | Guideline will not be modified. | MOIT           | 5    |
| 80  | 2    | Article 214-1-4.1.3   | Basic treatment method<br>In Fig-10, unit of impurity size in the region of low molecular and colloid area is nanometer (nm)   | Need to revise unit of them from "mm" to "nm" on the region of low molecular and colloid in Fig-10 | ×               |                   | The unit in the low-molecular in the table-10 must be "1,000mm" to "1,000nm".  | Guideline will be modified.     | JICA           | 5    |
| 80  | 2    | Article 214-1-4.2.3(1)  | Configuration of filtration layer<br>Configuration of filtration layer is needed to describe more clear  |  | ×               |                   | Please read -4.3.1(1) carefully.   | Guideline will not be modified. | —              | 5    |
| 80  | 2    | Article 214-1-4.3.1   | Type of ion exchange water system<br>Need to clarify this item: "Counter-current regeneration type" and "co-current regeneration type" to compare between 2 methods.                                       |  | ×               |                   | Please read -4.3.1 carefully. The regeneration method has been shifted to "counter-current and combined " from "co-current".   | Guideline will not be modified. | —              | 5    |
| 80  | 2    | Article 214-1-4.3.4   | Ion exchange water system with polisher<br>Need to clarify concept of this item: "polisher", constitution principle and its effects  |  | ×               |                   | "Polisher" is the cartridge demineralizer with high quality ion exchange resin to produce ultrapure water.   | Guideline will not be modified. | —              | 5    |
| 80  | 2    | Article 214-1-4.4.2(2)  | Electric desalination unit<br>Instruction "combination of reverse osmosis and electric desalination unit as shown in Fig-20" is wrong  | Need to re-instruct as follow Fig -24  | ×               |                   | "Fig-20" must be modified to "Fig-24".   | Guideline will be corrected.    | JICA           | 5    |
| 81  | 2    | —   | Add guideline contents on fuel reserved system of coal, oil, gas for thermal power plants  |  |                 |                   | It cannot cope, since the content of request for additional guidance is very vague. The outline and point for safety for handling and storage facility of coal fuel, oil fuel, gas fuel has been introduced. | Guideline will not be modified. | —              | 6    |
| 82  | 2    | —   | Add guideline contents on electrical feed-water pump   |  |                 |                   | It cannot cope, since the content of request for additional guidance is very vague.  | Guideline will not be modified. | —              | 6    |

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|-----|------|--------------------------------|--|-------------------------------------|-----------------|-------------------|---|---------------------------------|----------------|------|
|     |      |                                | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution                  |                |      |
| 83  | 2    |                                | Add guideline on design for disposal area of dry slag  |                                     |                 |                   | There is no choice but to landfill on the land or costal area, since about half of the coal ash cannot be reused, though the fly-ash is reusable. It has been introduced in the Vol. of coal ash handling.  | Guideline will not be modified. | —              | 6    |
| 84  | 2    | —                              | Add guideline on design for heat recovery system of gas-fired power plants   |                                     |                 |                   | HRSR is included in the boiler as the heat exchanger that has no combustor. It has been introduced in the Vol. of boiler.   | Guideline will not be modified. | —              | 6    |
| 85  | 2    | —                              | Add guideline on classification of crude and fine fuel; high and low heating value.  |                                     |                 |                   | We donot intend to introduce the design method of all facilities in the power plant by guidelines. Guideline is to intend interpret the technical requirement for safety and introduce the example to achieve requirement.  | Guideline will not be modified. | —              | 6    |
| 86  | 2    | —                              | Add guideline on design for pipeline sytem ( distance, pipeline ditch, contour crossing,...)   |                                     |                 |                   | It cannot cope, since the content of request for additional guidance is very vague. Materials havee been introduced in the Vol. of steam turbine, calculation piping thichness has been introduced in the Vol. of boiler, material and thichness calculation has been introduced in hte Vol.of oil, gas, liquefied gas handling facility. | Guideline will not be modified. | —              | 6    |
| 87  | 2    | —                              | Add guideline on design for electrical part in thermal power plants  |                                     |                 |                   | It cannot cope, since the content of request for additional guidance is very vague.   | Guideline will not be modified. | —              | 6    |
| 88  | 2    | Article 256-1 SCADA/EMS system | Please check the contents of this section, because the current layout can understand the SCADA system including DCS control system of the power plant while now in Vietnam SCADA systems only havecollects data for operating the electric system and the data |                                     |                 |                   | Article 258-1 shows the outline of the functions of SCADA/EMS system but whether use of a control function of the SCADA system is not even mentioned, it depends on user's decision.  | Guideline will not be modified. | —              | 7    |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility   | Ver. |   |
|-----|------|---------------------|---|-------------------------------------|-----------------|-------------------|--------------------------------|--|--|------|---|
|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |  |      |   |
| 1   | 4    | Article 5.          | Clarify and add regulation according to Guideline form on the technical economic criterion need to meet:  |                                     |                 |                   |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. Guideline is the voluntary guide to achieve the requirement of technical regulation.  | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-2.<br>See Appendix-7. | MOIT | 2 |
| 2   | 4    | Article 5.          | <p>1. The main technical economic criterions must support, planning and supervision to achieve:</p> <ul style="list-style-type: none"> <li>- Electricity production and bar power output (commercial) of each power plant and electrical systems.</li> <li>- System of operational readiness of units in each power plant and electrical systems.</li> <li>- Standard fuel consumption rate/kWh of production of each power plant and power system.</li> <li>- Water consumption rate/kWh of production of each hydro power plant.</li> <li>- Power loss of transmission systems (NPT) is calculated as the absolute value of kWh and % compared with the transmitted power on grid.</li> <li>- The staff personnel in the operation and repair of electrical / MW for each power plant , transmission stations and power systems including the transferred staff from other areas.</li> <li>- Cost of busbar electricity (commercial) of each power plant and power system.</li> <li>- The cost of repair, maintenance / MW installed capacity.</li> <li>- Profits of power systems.</li> </ul>  |                                     |                 | x                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. It is not appropriate as the comment for guideline.   | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 3   | 4    | Article 5.          | 2.In each power plant, on the basis of test results to establish the standard performance curve to determine the dependencies between the operation criterion in quality and quantity of technological equipment on the electricity load and heat load at condition good ,at the optimal mode and at different combinations of operating units. The standard performance curve must be accurate, it is necessary based on factors that the operating conditions must be strictly, show the efficiency of technical improvement measures and measures were applied other .   |                                     |                 | x                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 4   | 4    | Article 5.          | <p>3.The contents of the standard performance curve of unit :</p> <ul style="list-style-type: none"> <li>- Include specified main criterion for the economy when operating equipment. These criterions in accordance with the instructions on the amount of content and form shape of the energy curves including the necessary data for optimal load distribution between units and between the power plants.</li> <li>- Indicate the operating conditions when making the standard curve (types and characteristics of fuel, steam condition and combustion gas parameters before turbines, water column and discharge height for hydropower turbines, pressure and temperature of air of the surrounding environment for gas turbine, measuring condenser vacuum, cool water temperature ...).</li> <li>- Set the correction curve when operating conditions of devices change regardless of operating personnel.</li> <li>- On basis of the standard performance curve of units, units establish the graph to determine the fuel consumption rate and rate of water consumption taking into account the allowable operating conditions . In particular, taking into account the optimum combination of operating units and the load distribution between economic units.</li> </ul> |                                     |                 | x                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |



3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility   | Ver. |   |
|-----|------|---------------------|--|-------------------------------------|-----------------|-------------------|--------------------------------|--|--|------|---|
|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |  |      |   |
| 5   | 4    | Article 5.          | 4. Review periodically to calibrate the standard performance curve, the graph of fuel consumption rates and the graph of water consumption if calculating consumption rate exceeds 1% compared with the approved level due to improvements, changes system diagram, changes type of fuel.  |                                     |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 6   | 4    | Article 5.          | 5. Distribution of load between plants based on:<br>- Fuel consumption in the energy system is minimum.<br>- To reduce power losses in the grid.<br>- To ensure supply the fuel .<br>- To ensure supply reliably of electricity to consumers.  |                                     |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 7   | 4    | Article 5.          | 6. At each power plant must issue the procedure on start, stop, the load-carrying unit depending on and general load and load-carrying time  |                                     |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 8   | 4    | Article 5.          | 7. The standard performance curve and some of the essential rating criteria should be disseminated to the operator under chart mode chart form , procedure, spreadsheet and graphs. Officers and employees of the power plant should be actual trained for setting methods and maintaining the economic mode of operation of the devices.  |                                     |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. The meaning of "Standard curve" is vague. The curve such as start and stop for individual unit must be according to the manufacturer's recommendation. It is not uniformly defined in the technical regulation. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |
| 9   | 4    | Article 7.          | Responsibilities of units of electricity activities; electrical technical regulation-Vol.4<br>- Leader of the power plants, the electricity companies, workshops, calibration team, shift chief, crew chief should be checked regularly maintaining the economic mode of operation of the device, the observance of the mode chart and must implemented measures to overcum the errors found.<br>- The result of operation of the shifts , the workshops of the power plant, the electricity company should be regularly analyzed to officers and employees grasp the operation experience of the the shifts and advanced individual person intended for enough analyze the shortcomings has happened. In addition, should to statistic criterias of operation of device to check the reliability and the economics of them. |                                     |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. It is not appropriate as the comment for guideline.   | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT | 2 |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph   | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility  | Ver. |   |
|-----|------|---|--|---|-----------------|-------------------|--------------------------------|--|---|------|---|
|     |      |   | Comment  | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |   |      |   |
| 10  | 4    | Article 7.  | - Leader of the energy enterprises should ensure the correct working of the testing equipment, measurement, provision of statistical mode and monthly, quarterly, year reporting mode in uniform on the form of the index of the measuring testing meter and the measuring results.<br>- The shift chiefs, the workshop managers and factory leaders need to see a summary table of the main criterias on the operation of power plant in the day.   |   |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. It is not appropriate as the comment for guideline.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b>   | MOIT | 2 |
| 11  | 4    | Article 7.  | - The power plant, transmission companies, electricity companies need to conduct regularly analysis of technical economic criterias. When analyzing the need to check the implementation of the norm criteria and mode charts including the conduct of technical organizational measures and the effectiveness of that measures, detecting defects on the status of device, defects in the operation mode and other factors affecting the technical economic criterias which set out the remedies. For example, the need to conduct a comparison of actual losses on the grid and optimal losses.  |   |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. It is not appropriate as the comment for guideline.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b>   | MOIT | 2 |
| 12  | 4    | Article 7.  | - The power plants, the electricity companies must annually compose and submit to competent agencies for approval of plans on measures to enhance reliability and economy of operation include: Fuel saving, self-electric saving, reducing power losses on the grid.  |   |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency. It is not appropriate as the comment for guideline.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b>   | MOIT | 2 |
| 13  | 4    |   | Compared with the "Technical Rules for operation of power plants and power grids", the Department of Energy issued in 1990 with new electrical engineering without regulation some of the things listed below. This is necessary to ensure safe operation of equipment reliability at the trial stage and during subsequent operation. If this discarding of the material provisions of this content should be clarified. These contents can be modified to suit present but not completely removed. Here are the contents of the "Technical Rules for operation of power plant and grid" proposal to retain the new power in the Technical Regulations.   |   |                 | ×                 |                                | The oil management regulation must be provided in the administration manual in each power station according to the recommendation of manufacturer's recommendation. There is no meaning to provide such table as common information for all power plants. Conversely, misuse is worried about. | The only spiritual theory is defined in the common part.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b><br><b>See Appendix-13.</b> | MOIT | 4 |
| 14  | 4    | Chapter 2<br>Acceptance of Equipment and Plants for putting in Operation, Article 11<br>Acceptance of equipment | "Please add the following as in the old technical rules management:<br>- The shortcomings and errors in construction and assembly including defects of devices detected during test run each section and the test must be the construction and manufacturing plants to overcome before synthetic test. - when you start to try to test the device's ability to work and the technological scheme, the security your entire operation, inspect and adjust all control system of automatic adjustment, protection devices, test and measurement signal, check availability for testingsynthetic devices. equipment Before starting to prepare the conditions to ensure reliable equipment operation and safety | Request additional consideration, if no additional proposed to explain these issues mentioned in the document, or the reason. |                 | ×                 |                                | The technical regulation is intend to specify the minimum technical requirement on safety and security. It is not appropriate as the comment for guideline. Such thing must be verified as the matters of EPC Contract.  | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b>   | MOIT | 4 |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility | Ver. |
|-----|------|--|--|---|-----------------|-------------------|--|---|----------------|------|
|     |      |  | Comment  | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                |      |
| 15  | 4    | Chapter 2 (Fuel transportation and supply)/Article 101 (General provision)                 | 1.Circular of Ministry of Transport on the management of inland Roadway navigation (No. 23/2011/TT-BGTVT)  | Please change it to: "(1) Circular of the Ministry of Transport on the management of inland Waterway navigation (No. 23/2011/TT-BGTVT)" |                 | ×                 |  | Guideline will be modified according to the comment.<br><b>See Appendix-10.</b><br><b>See Appendix-11.</b>    | JICA           | 4    |
| 16  | 4    | Chapter 3 Personnel Preparation, Article 15 General requirements for personnel preparation | Please add the following as in the old technical management rules: - Each staff member before receiving operation, calibration, testing and repair equipment must be examined energyhealth in accordance with the approved industry and during the later need periodic medical examinations as prescribed,   |   | ×               |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. It is not appropriate as the comment for guideline. Matters of safety, health must be legulated by other laws and regulations other than regulation for generation facility. | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |
| 17  | 4    | Chapter 3 Personnel Preparation, Article 16. Knowledge test for personnel                  | "Why is 16 the new power of the technical regulations prescribed only for the boiler inspector, other areas also need to check * Please add the following as in technical management rules old: - direct employees of the power plant, before the independence necessary to be: 1. necessary theoretical training; 2. Training in working position; 3. Testing knowledge according to the volume required for the position; - production and repair workers, including engineers, technicians receive the energy sector enterprises are only allowed to receive independent effect after controlling Check the volume of knowledge required for positions in the time set by that enterprise leaders. - For all the operators and repair personnel are required to organize the forms of learning in production and improve the position of the following transactions: 1, by training in each course; 2 mentor training for new employees work (except for workers to drive the crane and elevator operators); 3 Guide the process (when new, before and periodically); 4. Rehearsal troubleshooting; 5. Rehearsal fire in the power systems should have their own classrooms or the basis of learning to train and improve the professional staff member .. - Must conduct periodic checks of knowledge workers and technical staff to operate and repair of energy enterprises, for workers and technical staff of enterprises and institutions directly involved in the repair, adjustment and testing of power equipment of power plants and power grids as | Request additional consideration, if no additional proposed to explain these issues mentioned in the document, or the reason.           | ×               |                   | JICA expert is not familier the qualification system. The technical regulation is intend to specify the minimum technical requirement on safety and security. If MOIT require the extensive regulation, MOIT must organize it.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |
| 18  | 4    | Chapter 3, Completion inspection in Part IV Thermal power plant                            |  | Request additional consideration, if no additional proposed to explain these issues mentioned in the document, or the reason.           | ×               |                   | The content of comment is unknown.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph                       | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility | Ver. |
|-----|------|---|--|---|-----------------|-------------------|--|---|----------------|------|
|     |      |   | Comment  | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                |      |
| 19  | 4    | Chapter 3<br>Personnel<br>Preparation     | Lack some of the following: Article 26. Each staff member before accepting the operation, adjustment, testing and repair of energy equipment shall have a health examination in accordance with the approved industry and during the later need medical periodic health in accordance with the provisions of Article 27. Direct staff to date of the power plant, the basis of the level before you can work independently or transferred to other work by the decision unit leaders have to be: 1. The necessary theoretical training; 2. Training in working position; 3. Check the volume of knowledge required for titles; 4. Perform the functions of employee direct work placement date (coaching) or a similar plant if employees are trained to work in the first unit. Production and repair workers, including engineers, technicians receive the energy sector enterprises are only allowed to receive independent work after checking the volume of knowledge required for positions in time determined by that enterprise leaders. Article 28. For all the operators and repair personnel are required to organize these forms of learning in advanced manufacturing locations and the following transactions: 1, by training in each course; 2 training together pairs for new employees work (except for workers and crane drivers elevator operation); 3 Tutorial processes (when new, before taking a job and recurring); 4. Troubleshooting exercises; 5. Fire drills. In energy systems should have their own classrooms or learning | Request additional consideration, if no additional proposed to explain these issues mentioned in the document, or the reason. |                 |                   | JICA expert is not familiar the qualification system. The technical regulation is intend to specify the minimum technical requirement on safety and security. If MOIT require the extensive regulation, MOIT must organize it. | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |
| 20  | 4    | Chapter 4,<br>Boiler and its<br>auxiliary | Lack of these things compared to the old Rules of this is still needed: Article 313 of the old rules on feed water into the steam drum temperature furnace startup must be within the permissible limits. (This provision to ensure thermal stresses in the shell slightly larger than the allowed limit); Article 326 of the old rules: The water level in the steam drum is in operation must be maintained in the range between the upper limit and the powers under the provisions on the basis of manufacturers' processes and experiments; Article 343 of the old rules: stop the boiler room ventilation after smoke road should be closed all the shield on the hood, the holes and door wing who get as well as the direction of the fan and fan the smoke. (This provision to prevent the boiler cools rapidly causing large thermal stresses boiler metal)  | Please review and supplements.  |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. Operation of power plant must be pursuant to the O&M Manual of manufacturer.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |
| 21  | 4    | Chapter 5<br>Steam turbine                | Lack of these things compared to the old Rules of this is still needed: Article 366 old rules: When the turbine shaft not work ban steam into the insert, blow off some steam or hot water in the condenser, steam into the turbine dryers. For no-shaft turbines, steam into the conditions specified in the turbine plant processes. (This provision to avoid the curved axis turbines); Article 369 of the old rules regulating turbine vibration; In the new technical regulations do not have provisions for monitoring of important parameters in the operation of the turbine.  | Please review and supplements.  |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. Operation of power plant must be pursuant to the O&M Manual of manufacturer.   | Guideline will not be modified.<br><b>See Appendix-1.</b><br><b>See Appendix-5.</b><br><b>See Appendix-7.</b> | MOIT           | 4    |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibility | Ver. |
|-----|------|--|--|-------------------------------------|-----------------|-------------------|--|--|----------------|------|
|     |      |  | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                |      |
| 22  | 4    | Chapter 7 Executing Responsibility, Article 34 Compliance with technical standards for operation | "Please add the following as in the old technical rules management (on stage 34): - All the positions and equipment in the plant must satisfy the processes required set, the process should be made in accordance with the requirements of technical regulations on the basis of design and manufacturing data, the manufacturer's documentation, the documentation of the management, operational experience and test results as well as taking into account local conditions: processes by deputy director of plant engineering approval. - In the operating procedures and equipment, buildings and structures, control systems and parts of control systems, relay protection, remote control, contact information of each unit should be clearly stated: 1. Tom off the device characteristics units, buildings and the work; 2. Trinh the preparatory work boot, the boot sequence stops and maintenance of equipment, buildings and maintenance works during normal operation and in the mode the incident; 3. Regulations allow for review, repair and testing equipment buildings and structures; 4. safety technical requirements, explosion and fire characteristics for equipment this. - In the process of the tasks for each job position should clearly state: 1. Lists operating procedures and equipment, other circulars, diagrams and design equipment that transport staff operating in this position are required to know; 2. powers, duties and responsibilities of the operator; 3. relationship with the operators superiors. |                                     |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency relating to the management of power plant. It is not appropriate as the comment for guideline.                                       | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT           | 4    |
| 23  | 4    | Technical documents, Article 84  | In the operation process equipment, buildings and structures, parts of control systems, relay protection, remote control, contact information of each unit should clearly: 1. Tom off characteristic equipment units, buildings and the work; 2. Trinh the preparatory work boot, the boot sequence stops and maintenance of equipment, buildings and maintenance works during normal operation and in incident mode; 3. The rules allow for review, and test equipment repair houses and buildings; 4. The technical requirements of safety, explosion prevention, fire characteristics for this equipment.   |                                     |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency relating to the management of power plant. It is not appropriate as the comment for guideline. This comment is out of thermal scope. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT           | 4    |
| 24  | 4    | Technical documents, Article 85  | In the process the task for each job position should clearly state: 1. List of operating procedures and equipment, other circulars, diagrams and device structure where employees operate in this position are required to know; 2. The powers, duties and responsibilities of the operator; 3. Relationships with operational staff superiors, subordinates and other staff involved in the work.   |                                     |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency relating to the management of power plant. It is not appropriate as the comment for guideline. This comment is out of thermal scope. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT           | 4    |
| 25  | 4    | Technical documents, Article 470   | To periodically check the heat automatically according to the current methods and procedures in accordance with the schedules approved by the plant engineer.  |                                     |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. It does not specify performance, efficiency and economic efficiency relating to the management of power plant. It is not appropriate as the comment for guideline. This comment is out of thermal scope. | Guideline will not be modified.<br>See Appendix-1.<br>See Appendix-5.<br>See Appendix-7. | MOIT           | 4    |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side   | Conclusion  | Responsibility | Ver. |
|-----|------|---------------------|--|--|-----------------|-------------------|---|---|----------------|------|
|     |      |                     | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                |      |
| 26  | 4    | Article 102         | Fuel characteristic  | Add heating value table of indonesia coal                                      |                 |                   | We will add the coal specification of Indonesia and China, and add the light oil specification.<br>If you do the basic plan of the power plant, it must not be done by such fragmentary information which are found in a handbook. You must actually analyze the coal that can be secured in the long term and determine the design coal. Although it is easy to describe a fuel property of a sample coal, those sample coals are not always guaranteed to be available. | Guideline will be modified.                               | JICA<br>MOIT   | 6    |
| 27  | 4    | Article 109         | Guideline on number of coal conveyor system from coal dock to coal storage yard and from coal storage yard to power plant. |  |                 |                   | It depends on the selection of Owner to determine the number of coal stock yard facilities. This comment is a comment for Vol.2 and the degree which the number of facilities affects the safety and security is low.   | Guideline will not be modified.<br><b>See Appendix-9.</b> | MOIT           | 6    |
| 28  | 4    | Article 112         |  | If necessary, shall reduce the load on demand to operate power plant in a time |                 |                   | It depends on the selection of Owner to determine the number of coal feeding facilities. It is not appropriate as the comment for Vol.4 because the degree which the number of facilities affects the safety and security is low.   | Guideline will not be modified.<br><b>See Appendix-9.</b> | MOIT           | 6    |
| 29  | 4    | Article 117         |  | 3 heating method: Steam, electric, or combination of steam and electric        |                 |                   | It depends on the selection of Owner to determine the heating method of heavy oil. As long as the heating facilities are operated while meeting the operation requirements of the heating facilities, the risk of safety and security is low.   | Guideline will not be modified.<br><b>See Appendix-9.</b> | MOIT           | 6    |
| 30  | 4    | Article 142         | Consideration of environmental provisions on the back ground emission of region has many thermal power plants concentrate  |  |                 |                   | The content of comment is unknown. JICA request the Vietnamese side to provide with more specific information. The water quality criteria of boiler is described to "Design of Water Treatment Facility" of Vol.2.  | Guideline will not be modified.                           | MOIT           | 6    |
| 31  | 4    | Article 242         | De-NOx devies  | Add de-NOx devies for gas-fired power plants                                   |                 |                   | The NOx reduction method of Gas Turbine is introduced in Article 186. Also, the other method in order to remove NOx is to inject ammonia. The NOx reduction method is described to "Design of Environmental Facility" of Vol.2.   | Guideline will not be modified.                           | MOIT           | 6    |
| 32  | 4    | Article 374         | Additional optical table system for emergency lighting.  |  |                 |                   | An emergency lighting system must be generally regulated by other laws or regulations, such as building code by the ministry of construction, other than the technical regulation for a power plant and substation. It is not appropriate as a comment for the guideline but locations where an emergency lighting is generally installed will be added in the guideline for reference.   | Guideline will be modified.                               | JICA<br>MOIT   | 6    |

**3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)**

*(Prepared on 1/2/2013)*

| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion                      | Responsibility | Ver. |
|-----|------|----------------------|---|--|-----------------|-------------------|--|---------------------------------|----------------|------|
|     |      |                      | Comment   | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution                  |                |      |
| 33  | 4    | Article 160<br>9.(2) | (2) AH is operated by air motor .....   | suggest to translate ::<br>(2) rotary air heater is operated by compressed air motor ...<br>Explanation: When it has lost all supply power, so the motor does not work, shall switch to operated by compressed air motors.   |                 |                   | We are not involved with the translation issues. It must be considered in the process of promulgation. The technical regulation is intend to specify the minimum technical requirement on safety and security. The Owner must create a manual of start-up condition and operation method of each equipment in accordance with manufacturer's instructions. | Guideline will not be modified. | ETC<br>MOIT    | 6    |
| 34  | 4    | Article 199<br>1.(3) | 1)Turning oil pump  | suggest to translate :<br>1) Turning oil pump<br>Explanation: When gas turbines stop then force rotation to avoid local hot and cause bent turbine shaft. Wherefore the shaft shall be rotated . Usually, some gas turbines with shaft rotary system by oil pump and jack.   |                 |                   | We are not involved with the translation issues. It must be considered in the process of promulgation. The technical regulation is intend to specify the minimum technical requirement on safety and security. The Owner must create a manual of start-up condition and operation method of each equipment in accordance with manufacturer's instructions. | Guideline will not be modified. | ETC<br>MOIT    | 6    |
| 35  | 4    | Article 251          | page 193:<br>Moreover, reactive lagging power factor loads require more excitation than unity power factor loads, while leading power factor loads require less.  | suggest to translate :<br>Moreover, reactive power factor loads require more excitation than unity power factor loads, while leading power factor loads require less.<br>Field voltage should be translated to the excitation voltage.   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |
| 36  | 4    | Article 251          | Page 195:<br>Having no AC exciter provides faster transient response and better transient stability with the help of Power System Stabilizer (PSS: referred later), but has a risk of source power lost in the case of failure.   | suggest to translate :<br>Because of having no AC exciter, it provides faster transient response and better transient stability with the help of Power System Stabilizer (PSS: referred later), but has a risk of source power lost in the case of failure.  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |
| 37  | 4    | Article 251          | Page 195<br>3. Automatic Voltage Regulator (AVR)<br>(3) Overexcited Reactive-power Limiter  | suggest to translate : (3) Overexcited Reactive-power Limiter  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |
| 38  | 4    | Article 253          | Page 200 (Article 253)<br>(3) Less windage loss than air due to 1/14 density.   | suggest to translate<br>(3) Less windage loss than air due to 1/14 density.  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |
| 39  | 4    | Article 260          | Page 204, Article 260<br>When a generator is operated under unbalanced load, negative phase current flows in the stator coil, generating the revolving magnetic field which revolves in the opposite direction at the same speed of the rotor. This causes eddy current of double frequency flows on the surface of the rotor and the rotor wedge. This makes the rotor overheated especially in the part in which the eddy current concentrates. If the unbalance becomes serious, burning or strength deterioration may be caused by local overheating. | Suggest to revise :<br>When a generator is operated under unbalanced load, negative sequence phase current flows in the stator coil, generating the revolving magnetic field which revolves in the opposite direction at the same speed of the rotor. This causes eddy current of double frequency flows on the surface of the rotor and the rotor wedge. This makes the rotor overheated especially in the part in which the eddy current concentrates. If the unbalance becomes serious, burning or strength deterioration may be caused by local overheating. . |                 | ×                 | "negative phase current" will be corrected to "negative-sequence current".   | Guideline will be corrected.    | JICA           | 6    |

3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side   | Conclusion                     | Responsibility      | Ver. |
|-----|------|---------------------|---|---|-----------------|-------------------|---|--------------------------------|---------------------|------|
|     |      |                     | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution                 |                     |      |
| 40  | 4    | Article 261         | Page 205<br>Article 261 Operation as a Motor<br>In the case of a synchronous generator, motor mode of operation is prohibited in principle, because if a generator turns into a motor, prime movers and the generator may be damaged, and also power system may become instable.  | Suggest to revise :<br>Article 261 Motor mode of operation<br>In the case of a synchronous generator, motor mode of operation is prohibited in principle, because if a generator turns into a motor, prime movers and the generator may be damaged, and also power system may become instable.  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT         | 6    |
| 41  | 4    | Article 262         | Page 207 (Article 262)<br>(2) Range restricted by stator coil temperature<br>Restriction by the stator coil temperature may be obtained from constant conditions of the stator current. It becomes a circle which passes through rated point P=1.0 (p.u) with the origin point as the center of the circle.   | Suggest to revise :<br>(2) Range restricted by stator coil temperature<br>Restriction by the stator coil temperature may be obtained from constant conditions of the stator current. It becomes a circle which passes through rated point P=1.0 (p.u) with the origin of grid as the center of the circle.  |                 | ×                 | Guideline will be modified form "the origin point" to "the origin of grid" according to the comment.  | Guideline will be modified.    | JICA                | 6    |
| 42  | 4    | Article 262         | Page 208 (Article 262)<br>(A) Range restricted by generator steady state stability<br>Steady-state instability occurs where there is too much impedance from the plant to the load especially in under excited condition.   | Suggest to revise :<br>(A)Range restricted by generator steady state stability<br>Steady-state instability occurs where there is too much impedance from the plant to the load especially in under excited condition. (low excitation)  |                 | ×                 | "(low excitation)" will be added as supplementation.  | Guideline will be modified.    | JICA                | 6    |
| 43  | 4    | Article 265         | Page 213 (Article 265a1)<br>In the case of squirrel-cage induction motors, if the motor speed is controlled, voltage of the motor should be controlled to prevent heat by over-flux. This function may be equipped with an inverter controller.   | Suggest to revise :<br>In the case of squirrel-cage induction motors, if the motor speed is controlled, voltage of the motor should be controlled to prevent heat by over-flux. This function may be equipped with an inverter controller.  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese, but the written error in English will be corrected. | Guideline will be corrected.   | JICA<br>ETC<br>MOIT | 6    |
| 44  | 4    | Article 376         | Page 218 (Article 376)<br>- Aqueous solution of potassium hydroxide (KOH) mixing tank   | Suggest to revise :<br>- Aqueous solution of potassium hydroxide (KOH) mixing tank  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT         | 6    |
| 45  | 4    | Article 377         | Page 219:<br>When the electrolytic hydrogen production system is tripped during operation, operators of the system should rush to the system within 15 minutes after the trip. Also, the system should not be restarted before ensuring the following:  | Suggest to revise :<br>When the electrolytic hydrogen production system is stopped due to damage during operation, operators of the system should rush to the system within 15 minutes after the trip. Also, the system should not be restarted before ensuring the following:  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT         | 6    |
| 46  | 4    | Chapter 15          | Page 222<br>Chapter 15 Oil Energy   | Suggest to revise :<br>Chapter 15 Energy oil  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT         | 6    |
| 47  | 4    | Article 384         | Page 223 (Article 384)<br>Air movement occurs between air and electrical equipment with insulating oil by different of temperature when operation and the insulating oil may be gradually contaminated with oxygen and moisture from the air. If there is poor sealing or oil leakage by deterioration of breathers or packing, or looseness of sealing, contamination with oxygen and moisture will be accelerated.<br>Since oxygen inhibitors in the insulating oil depletes with the passage of time, the oxygen rate in the insulating oil gradually increases, and moreover, oxidation of the insulating oil which contains oxygen and moisture is accelerated by generated heat during operation. | Suggest to revise :<br>Air movement occurs between atmosphere and electrical equipment with insulating oil by temperature varying when operation and the insulating oil may be gradually contaminated with oxygen and moisture from the air. If there is poor sealing or oil leakage by deterioration of breathers or packing, or looseness of sealing, contamination with oxygen and moisture will be accelerated.<br>Because of oxygen resistance in the insulating oil depletes with the passage of time, the oxygen rate in the insulating oil gradually increases, and moreover, oxidation of the insulating oil which contains oxygen and moisture is accelerated by generated heat during operation. |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT         | 6    |



**3. Technical Comment Table on Final draft of Guideline Vol.4 (Thermal Power Part)**

*(Prepared on 1/2/2013)*

| No. | Vol. | Article & Paragraph                            | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion                      | Responsibility | Ver. |
|-----|------|--|---|-------------------------------------|-----------------|-------------------|--|---------------------------------|----------------|------|
|     |      |  | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution                  |                |      |
| 48  | 4    | Article 159<br>Supervision of the cease-Boiler | "In the seventh forced cooling at the end of the boiler, please write the record straight, because according to this guide after split mesh generator, smoke fan, the fan continues to run while operating procedures ovenNMD Pha Lai, Hai Phong and Quang Ninh of EVN specified after separation grid running fan, fan the smoke to blow in about 10 minutes and then closed the roads smoke wind shield. forced cooling steps oven onlyafter a certain period of time (approximately 8 hours) to avoid cooling the oven too quickly increasing heat stress. " |                                     |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. In each power plant, the Owner must create a manual of start-up condition and operation method of each equipment in accordance with manufacturer's instructions. | Guideline will not be modified. | MOIT           | 7    |

4. Technical Comment Table on Final draft of Guideline Vol.5 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph                                       | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibility | Ver. |
|-----|------|---|--|--|-----------------|-------------------|--|---|----------------|------|
|     |      |   | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                |      |
| 1   | 5    | Article 141<br>Section 1<br>Interlock test                | "(1) Purpose: It has to be confirmed that the furnace cleaning is operated normally and boiler is burned after completing furnace cleaning to prevent furnace explosions at startup" (?) Originally in English is: "It must be confirmed that furnaces purge is operated normally and boiler is ignited after completing furnace purge to prevent furnace explosion at boiler starting". | Correct translation into Vietnamese must be: "(1) Purpose: "It must be confirmed that furnace purge is operated normally and boiler is ignited after completing furnace purge to prevent furnace explosion at boiler starting"   |                 | ×                 | We are not involved with the translation issues. It must be considered in the process of promulgation.   | Guideline will not be modified.<br>See Appendix-6.  | ETC            | 2    |
| 2   | 5    | Article 167-174   | "deleted", "has been developed" ?! There is no meaningless   | Originally in English is: "deleted", "to be developed" need to understand is: "No use" and "will be added later"   |                 | ×                 | We are not involved with the translation issues. It must be considered in the process of promulgation.   | Guideline will not be modified.   | ETC            | 2    |
| 3   | 5    | Abbreviation  | Abbreviations, MFT (Master Fuel Trip) is translated as the main fuel impact?! need to review.  | Cách hiểu chung của thuật ngữ này là : "Ngắt nhiên liệu chính"<br>General understanding of this term is: "Shut off the main fuel"  |                 | ×                 | We are not involved with the translation issues. It must be considered in the process of promulgation.   | Guideline will not be modified.   | ETC            | 2    |
| 4   | 5    | Part 4<br>Thermal Power Plants.<br>Article 174-1          | Rename the title: "inspection of measurement and control equipment"<br>Adding content as in the old technical management rules:<br>- Shall periodic inspection of the system control by method and the current process has been approved by engineering deputy director of plant   | As reference, figure of general matter for control device inspection will be added.<br>However, detail inspection procedures should be submitted from the manufacturer.  | ×               |                   | The control device is out of scope of this project.  | In principle, guideline will not be modified, such as renaming the title.<br>As reference, figure of general matter for control device inspection will be added.<br>However, each inspection procedure on each instrument should be submitted from the manufacturer.<br>See Appendix-1. | MOIT           | 4    |
| 5   | 5    | Part 4<br>Thermal Power Plant - Chapter 3, Test completed | should be replaced : "It must be checked " by "It must be confirmed "  |  |                 | ×                 | We are not involved with the translation issues. It must be considered in the process of promulgation. In the guideline, "must" is applied to those which is compliance to the general rule. | Guideline will not be modified.   | ETC<br>MOIT    | 6    |
| 6   | 5    | Article 168   | Page 186 (Article 168):<br>2) Shaft (journal)<br>Shaft journal part transmits the torque of the prime mover and also failure torque caused by power system. Thus, fatigue by the torque is accumulated.  | Suggest to translate:<br>2) Shaft (journal)<br>Shaft journal part transmits the torque of the prime mover and also failure torque caused by power system. Thus, fatigue by the torque is accumulated   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |
| 7   | 5    | Article 168   | 3) Rotor wedge and rotor teeth<br>A rotor wedge of a turbine generator is supported by rotor teeth and withstands the important duty holding the turbine-rotor coil under rotation such as 3,000 min-1. Rotor wedge and rotor teeth operate under very severe conditions due to the high stress generated by centrifugal force.  | Suggest to translate:<br>3) Rotor wedge and rotor teeth<br>Each rotor wedge of a turbine generator is hold by rotor teeth and withstands the important duty holding the turbine-rotor coil under rotation such as 3,000 min-1. Rotor wedge and rotor teeth operate under very severe conditions due to the high stress generated by centrifugal force. |                 | ×                 | Guideline will be modified form "A rotor wedge of a turbine generator is supported" to "Each rotor wedge of a turbine generator is hold" according to the comment.                           | Guideline will be modified  | JICA           | 6    |
| 8   | 5    | Article 168<br>Figure 168-6                               | Layer short<br>Field ground<br>slot insulation   | Suggest to revise:<br>Layer short<br>Field ground<br>slot insulation   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.  | Guideline will not be modified  | ETC<br>MOIT    | 6    |

4. Technical Comment Table on Final draft of Guideline Vol.5 (Thermal Power Part)

(Prepared on 1/2/2013)

| No. | Vol. | Article & Paragraph          | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side   | Conclusion                     | Responsibility | Ver. |
|-----|------|------------------------------|---|---|-----------------|-------------------|---|--------------------------------|----------------|------|
|     |      |                              | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution                 |                |      |
| 9   | 5    | Article 168                  | Page 188:<br>Nguyễn văn tiếng Anh:<br>7)Lead<br>Main lead is recommended to be inspected because this item is important to supply field current.<br>Moreover, flexible leads of pole connectors are recommended to be inspected because high centrifugal force is applied.  | Suggest to translate:<br>7)Lead<br>Main lead is recommended to be inspected because this item is important to supply field current.<br>Moreover, flexible leads of pole connectors are recommended to be inspected because high centrifugal force is applied.   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT    | 6    |
| 10  | 5    | Article 168                  | Page 189<br>4) Inspection of tube inside by fiber-scope (as necessary)<br>.....<br>(7) Bushing and surroundings<br>1) Damage, pollution of lead bushing and insulator<br>2) Discoloration of flexible lead by over heat<br>.....<br>6) Damage, pollution of neutral point cover   | Suggest to revise :<br>4) Inspection of tube inside by fiber-scope (as necessary)<br>.....<br>(7) Bushing and surroundings<br>1) Damage, pollution of lead bushing and insulator<br>2) Discoloration of flexible lead by over heat<br>.....<br>6) Damage, pollution of neutral point cover  |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT    | 6    |
| 11  | 5    | Article 168                  | Page 189,<br>(9) Measurement of shaft voltage<br>Voltage is generated at the bearing part of the rotor due to the electromagnetic unbalance between the stator and the rotor, and the electric charge by steam to the turbine blades. To protect corrosion at the bearing, shaft voltage is recommended to be measured.   | Suggest to translate:<br>(9) Measurement of shaft voltage<br>Voltage is generated at the bearing part of the rotor due to the electromagnetic unbalance between the stator and the rotor, and the electric charge by steam to the turbine blades. To protect corrosion at the bearing, shaft voltage is recommended to be measured. |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT    | 6    |
| 12  | 5    | Article 169                  | Page 190, 191, 192:<br>suggest to replace all "Field current " to "excitation current "   |   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT    | 6    |
| 13  | 5    | Article 169                  | Page 191,<br>(2) AC exciter with stationary rectifiers (Commutatorless exciter)   | Suggest to revise :<br>(2) AC exciter with stationary rectifiers (Commutatorless exciter)   |                 | ×                 | Translation issue should be concluded by Vietnam side because JICA expert does not comprehend expression in Vietnamese.   | Guideline will not be modified | ETC<br>MOIT    | 6    |
| 14  | 5    | Article 160<br>Boiler        | "To propose to the examination boiler should clearly needed due to the thickness of the tube furnace and superheater tubes at specific points to decide to wash the oven or not. Propose to explain why only apply rated remaining life expectancy only for the pipes connected to the boiler which does not apply to water-tube boilers and superheated steam and intermediate superheating though in the overhaul furnace tube cutting sample analysis. In assess the remaining life of the tube using the method of analysis of microscopic structure of materials will not be evaluated accurately suggest additional structural analysis of the microstructure of the material to assess the remaining life of the animal materials. " |   |                 |                   | The technical regulation is intend to specify the minimum technical requirement on safety and security. The Owner of each power plant must determine the inspection method of the boiler tube thickness and create a inspection manual. In additional, the guideline has been described the metallographic structure inspection and ultrasonic inspection etc. as the sample of the boiler tube inspection. | Guideline will not be modified | MOIT           | 7    |
| 15  | 5    | Article 162<br>Steam Turbine | Suggest additional content test turbine during the examination turbine  |   |                 |                   | It cannot cope, since the content of request for additional guidance is very vague.   | Guideline will not be modified | MOIT           | 7    |

## **Appendix-7.3**

### **Conclusion Table of Comments on Guidelines (after Progress Report No.2)**

#### **3. Network Group**

**1. Technical Comment Table on Final draft of Technical Regulation (General Issues) (Network Group)**

*(Prepared on 24/05/2012)*

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion                                 | Responsibilities |
|-----|------|---------------------|---|-------------------------------------|-----------------|-------------------|---|--|------------------|
|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution                             |                  |
| G0  |      |                     | The technical Regulations may be have contents or only title, but in guideline, it must be have contents (detailed guideline), for example: all of articles in guideline about power transformer from article 100 to article 115 , section 2 (page 42) from article 271 to 281 and from article 284 to 408 is not have any contents. Propose to uniform the titles and terminologies in Technical regulations and guideline.  |                                     | x               | x                 | When there is only title, JICA thinks No need to add the additional contents in their guideline.  | Both parties agree to the reply from JICA. | MOIT             |
| G1  |      |                     | Propose to supplying more requirements about accepted deviation while installation to ensure the qualities of works. Actually, In many cases the the deviation with design too big, but it does not any regulations to assess and reject it. Especially, there are no way to check the bending deflection of hard conductor while installation; bias of bushing od disconnecter so that it bring to decrease the reliability in operation. Propose to adding on Vol.3 of technical regulations. |                                     | x               |                   | These contents are various and difficult to describe the guideline. and should be decided based on manufacturer's judgment criteria on case by case.<br><br>In this regard, such standards cannot be stipulated in common rules in Guideline. | Both parties agree to the reply from JICA. | MOIT             |
|     |      |                     |   |                                     |                 |                   |   |  |                  |

## 2. Technical Comment Table on Final draft of Guideline Vol.1

| No. | Vol. | Article & Paragraph  | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion   | Responsibilities |
|-----|------|--|--|-------------------------------------|-----------------|-------------------|---|--|------------------|
|     |      |  | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 1   | 1    | Part 2: General requirements<br>Chapter 2-1 Common issues<br>I.2.5. Safety in electrical works | Safety for electrical work must comply with the provisions of the Electricity Law, decree 105/2005/decree 106/2005 date 17/8/2005 and decree 81/2009 date 12/10/2009; Circular 03/2010/TT-BCT date 22/01/2010 and national standards for electrical safety 12/2008/QĐ-BCT date 17/ 6/ 2008   |                                     | x               |                   | JICA follow the comments from VN side   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 2   | 1    | I.3.5  | Place of installation: floor for the operator  |                                     |                 |                   | JICA can not understand this comment. If this comments is for translation issue, Guideline in Vietnamese will be revised.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 3   | 1    | I.3.23.  | Please replace by " the lighting system"   |                                     |                 | x                 | Translation issue<br>Guideline in Vietnamese will be revised from "lightning" to "lighting".  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 4   | 1    | Chapter 3-3-8 overhead line go through less populated areas                                    | at clause 4 article I.1.8 Technical Regulations (vol 1) defined residential area and not residential area so Guideline must be compiled with the terms to suit content of Technical Regulations (vol 1)  |                                     | x               |                   | JICA will revise Guideline in accordance with the definition of "Populated area" and "Non populated area" in Technical Regulation Vol.1.<br>(This revision is the same of revision for General comment No.1 and this comment No.6.) | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 5   | 1    | I.3.106 Requirements for less populated areas  | I.3.106 Requirements for unpopulated areas<br>....Overhead line have voltage above 1kV through the woods must comply degree 81/2009/ND-CP date 12/ 10/2009 , Degree modify , additional some article of degree 106/2005/ND-CP date 17 / 8 / 2005 regulations particular and chi tiết và guiding the implementation of some articles of the Electricity Law on safety protection of high-voltage power grid |                                     | x               |                   | JICA will revised the description in article I.3.106 in Guideline from "54/1999" to "106/2005 and 81/2009".   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 6   | 1    | I.3.107  | I.3.107.ertical distance for unpopulated areas<br>The vertical distance from the lowest point of the wire to the ground in unpopulated areas ....  |                                     | x               |                   | JICA will revise Guideline in accordance with the definition of "Populated area" and "Non populated area" in Technical Regulation Vol.1.<br>(This revision is the same of revision for General comment No.1 and this comment No.4.) | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 7   | 1    | I.3.113. Overhead line go on the top of the housing and works.                                 | This content must belong "Technical Regulations (vol 1) - This requirement is mandatory, can't write in guideline.<br>Regulation in Table I.3.113 Distance from wires to house and buildings for the voltage 220 kV is 6m  |                                     | x               |                   | JICA mistook the distance of voltage of 220kV in Table I.3.113, so JICA will revise the distance from "5m" to "6m".<br>JICA will move the contents of this comment from Guideline to Technical Regulation.                          | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |

## 2. Technical Comment Table on Final draft of Guideline Vol.1

| No. | Vol. | Article & Paragraph                                      | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibilities |
|-----|------|--|---|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |  | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                  |
| 8   | 1    | I.3.136 . Distance to motorway                           | .... Deflection of the wire in the incident mode is calculated with conditions temperature equal average temperature of year, wind speed is zero    |                                     | x               |                   | JICA will revise the description in this article from "without wind" to "wind speed is zero". (This revision is the same of revision for this comment No.9.) | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 9   | 1    | I.3.138 . Distance to motorway                           | as above  |                                     | x               |                   | Ditto  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ATMT             |
| 10  | 1    | I.1.1.-22) Area Classification                           | In Article I.3.85 only 4 levels of contamination. Therefore proposed to remove a) Very light  | revised by VN side                  | *               |                   | JICA will confirm the revision in January.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | EVN Cao          |
| 11  | 1    | I.1.6 House and Outside Wirings with Voltage up to 35 kV | Adjusted to 110kV   | revised by VN side                  | *               |                   | JICA will confirm the revision in January.   | Cao Chan will revise the contents and JICA will check the revised parts.         | EVN Cao          |
| 12  | 1    | I.2.24 Voltage Drop in Indoor Power Systems              | Canceled because of the new rules are not specified   | revised by VN side                  | *               |                   | JICA will confirm the revision in January.   | Cao Chan will revise the contents and JICA will check the revised parts.         | EVN Cao          |
| 13  | 1    | I.2.28 Materials for Electrical Equipment                | Additional terms set by the I.2.61+I.2.94+I.2.104+I.2.127   | revised by VN side                  | *               |                   | JICA will confirm the revision in January.   | Cao Chan will revise the contents and JICA will check the revised parts.         | EVN Cao          |
| 14  | 1    | I.2.29 Distinction of Elements                           | Busbar conductors, conductors must be painted as follows: according to the provisions of Section 5 of Article I.1.2 Technical Regulations Volume 1. | revised by VN side                  | *               |                   | JICA will confirm the revision in January.   | Cao Chan will revise the contents and JICA will check the revised parts.         | EVN Cao          |

## 2. Technical Comment Table on Final draft of Guideline Vol.1

| No. | Vol. | Article & Paragraph                             | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side              | Conclusion   | Responsibilities |
|-----|------|---|--|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |   | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision             | Final Solution   |                  |
| 15  | 1    | Table I.2.42<br>Economic current density        | Remove economy current provisions for cable  | revised by VN side                  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 16  | 1    | I.2.91<br>Access for management and maintenance | Adjusted in accordance with the EVN  | Mr.Cao will check to EVN            | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 17  | 1    | I.2.94<br>Protection against Corrosion          | Corrosion protection shall comply with Article I.2.28-2 Guidelines - Volume 1<br>Remove Table I.2.94 (Reference) adhesion ratio of zinc galvanization  | Move to 1.2.28                      | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 18  | 1    | I.2.95<br>Warning Signs and Warning Lamps       |  | Move to 1.2.28                      | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 19  | 1    | I.2.104<br>Coating with an Anti-corrosive Layer | Corrosion protection shall comply with Article I.2.28-2 Guidelines - Volume 1.<br>Remove Table I.2.104-1 Thickness of plating and way of zinc plating I.2.113 Installation at Higher Elevation , Additional regulations under Code of electrical equipment | Move to 1.2.28                      | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 20  | 1    | I.2.126<br>Noise Regulations                    | Move: The noise reduction measures to GL<br>Move Table I.2.126-1and Table I.2.126-2  | revised by VN side                  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 21  | 1    | I.2.127<br>Corrosion Regulation                 | Corrosion protection shall comply with Article I.2.28-2 Guidelines - Volume 1.   | Move to 1.2.28                      | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |



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|-----|------|---|---|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |   | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision             | Final Solution   |                  |
| 22  | 1    | I.2.128 Oil Collecting Systems  | As defined in Article I.4.43 Volume 1 - Technical Regulation and Guidelines | Move to 1.4.33                      | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 23  | 1    | I.2.131 Billing Electricity Meters                                    | Adjustment: Requirements of the system measure the electrical energy        | Follow TT 32/2010/TT-BCT            | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 24  | 1    | I.2.132. Power metering system configuration                          |   |                                     | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 25  | 1    | I.2.133. Energy metering system                                       |   |                                     | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 26  | 1    | I.2.134. Technical requirements of the system measure                 |   |                                     | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 27  | 1    | I.2.135. Technical requirements for sealed, pair of lead and security |   |                                     | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |

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| No. | Vol. | Article & Paragraph   | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side   | Conclusion   | Responsibilities |
|-----|------|---|--|--|-----------------|-------------------|---|--|------------------|
|     |      |   | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 28  | 1    | I.2.141 Measuring Points for Frequency                        | Title is the measured frequency, but the content is measured capacity.<br>Additional Article of frequency measurement  | revised by VN side according to existing regulation article 1.6.30&31  | *               |                   | Frequency must be measured at:<br>1. Each section of busbar at voltage of generator of power plant.<br>2. Each system of high voltage busbars for power plants which generate electric power only at high voltage.<br>3. Points which divide electric power system into parts working asynchronously, two sides of synchronizing point.<br>4. Frequency indicating and recording meters must be installed at the National Load Dispatch Center and Regional Load Dispatch Centers, power plants with installed capacity of 50 MW upward in power system, independently operating power plants with capacity of 6 MW upward.<br>If generators of power plants have separate operation mode, frequency indicating and recording meters must be installed at each asynchronously operating part.<br>Frequency meters must be installed at Load Dispatching Departments of Power Companies, Provincial Electricity Utilities and Electricity Branches. Error of frequency meter must not exceed errors of frequency meters installed at the National Load Dispatch Center and Regional Load Dispatch Centers and power plants which participate in frequency regulation must not exceed <input type="checkbox"/> 0.1 Hz | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 29  | 1    | (I.3.33 -- I.3.39) Oil Supply Systems                         | Dispose of all the details in this. Just mentioned one sentence: The oil supply system for oil cables comply with the requirements of the manufacturer.  | revised by VN side   | *               |                   | JICA agreed to delete these articles on discussing Technical Regulation in October because oil supply systems are determined by the manufacturers in Vietnam.   | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 30  | 1    | I.3.62 Installation of Oil-Filled Power Cable Lines           | Dispose of all the details in this. Just mentioned one sentence: Installation of oil cable as required by the manufacturer.  | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 31  | 1    | I.3.74 Requirements for Conductors with Voltage exceeding 1kV | In Japan there are regulations on corona losses and power losses allow ?   | There is no regulation according to corona loss and power loss in Japan.<br>JICA added the calculation of corona loss in Guideline, because there is a description on corona loss in existing Standard in Vietnam.<br>(Reference) Power loss in Japan is usually about 5% or 6%. | *               |                   | JICA will confirm that there is the regulation or target for corona loss in Vietnam.<br>If not, JICA might delete the calculation.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 32  | 1    | I.3.97 Buried Portion of Poles                                | The depth of the column buried in the ground must be calculated according to the topographical and geological conditions as well as column placement physical and mechanical properties of the column to select accordingly. | Remove Table I.3.97 Length of Buried parts of the pole   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 33  | 1    | I.3.113 Traversing Houses and Structures                      | Houses and buildings in the corridor of the DDK to up to 220 kV voltage must comply with the following requirements. referred to in Article I.3.113 Technical Regulations Volume 1   | Remove Table I.3.113 Distance from conductor to house and structure in safety corridor.  | *               |                   | JICA agrees to remove Table I.3.113 to Technical Regulation.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |

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|-----|------|--|--|--|-----------------|-------------------|---|--|------------------|
|     |      |  | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 34  | 1    | I.3.115 Crossing Areas with Water  | Clearance distance from the power cord to inland waterway transport made by Table I.3.115-1 and Table I.3.115-2 Technical Regulations Volume 1.  | Remove all contents in detail.   | *               |                   | JICA will delete the content in this article and revise this article as below.<br>*Overhead power lines crossing area with water shall comply with this article in Technical Regulation Vol.1.* | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 35  | 1    | I.3.118 Vertical Distance in Crossing Places                                   | Table I.3.118 Distance between conductors with voltage up to 1 kV to ?   |  | *               |                   | JICA can not understand this comment for revising. JICA want to confirm the revision in this article in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 36  | 1    | Chapter 3-3-12 Crossing or Going Nearby Communication and/or Signal Lines      | Replaced by chapter 3-3-12 Cross or go near the outside telecommunication cable network according to the Technical Regulations QCVN 33:2011/BTTTT : National technical regulation on installation of outside telecommunication cable network of the Ministry of Information and Communication. | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 37  | 1    | I.3.135 Crossing or Going Nearby Car Roads                                     | Additional Table II.3.135: Technical Level roads   | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 38  | 1    | I.3.136 Distances to Car Roads   | In this section just yet traffic signals require mounting signs for OHL<br>Supplement Table I.3.136-1: The smallest vertical distance and the minimum horizontal distance from the conductor to the road under decentralized regional road and Area Classification.                            | Move Table I.3.136-2: Class of car road to GL  | *               |                   | JICA agrees to remove Table I.3.116-2 from Technical Regulation to Guideline.   | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 39  | 1    | I.3.143 Crossing or Going Nearby Aerial Transport Cable Lines and/or Pipelines | Adjust the name of the two tables according to the technical characteristics of the object.<br>Adjust the size stated in the second table size is now applied.   | Means the overhead cable transport - referred to as overhead cable transport to bridge or mesh to determine the scope of protection and safety protection DDK and underground cable lines connected to the DDK must distancesafety according given in Table I.3.143. | *               |                   | JICA can not understand this comment for revising. JICA want to confirm the revision in this article in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 40  | 1    | Table I.3.144. Distance to pipeline gas, oil and petroleum products            | OHL with voltage exceeding 1 kV cross or go near the gas pipeline, oil and petroleum products to ensure the safety distance according to the regulations for oil and gas.  | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 41  | 1    | I.4.5 Power Sources of the Circuit Breaker                                     | Adjust I.4.5 Isolation devices for Aptomat   | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |
| 42  | 1    | I.4.6 Connecting Direction of Fuses and Automatic Circuit Breakers             | Adjust I.4.6.direct connection fuse  | revised by VN side   | *               |                   | JICA will confirm the revision in January.  | Cao Chan will revise the contents and JICA will check the revised parts. | EVN Cao          |

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|-----|------|---|---|---|-----------------|-------------------|--|--|------------------|
|     |      |   | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision             | Final Solution   |                  |
| 43  | 1    | I.4.33 Fire Prevention Measures of Outdoor Substations                  | Adjust (1), (2), (7), (8) As defined in Article I.4.33 - Technical Regulations Volume 1 (3), (4), (5), (6) oil collection system.<br>Adjust Additional figure I.4.33-1 I.4.33-2 I.4.33-3  | revised by VN side  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 44  | 1    | I.4.56 High Oil-content Circuit Breaker                                 | Remove This is because there is no use  | revised by VN side  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 45  | 1    | I.4.62. Device configuration and distribution substations               | Adjusted to fit the figure.   | Figure I.4.62 Japanese installation example of drive engine with lock system of the disconnecting switch in one pole (Reference)<br>Adjusted to Figure I.4.62 Install circuit breaker on pole | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 46  | 1    | I.4.70 Oil Treatment System Protected against Direct Lightning Strikes. | Remove This is because there is no use  | revised by VN side  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 47  | 1    | I.4.94 Installation Oil Tanks and I.4.95 Oil Tank                       | Remove This is because there is no use  | revised by VN side  | *               |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 48  | 1    | I.5.14 Protection Zones   | Figure I.5.15-2 Protection Zone and the arrangement of circuit breaker and current transformer<br>In figure a) shows two current transformer windings on two sides of the circuit breaker.<br>In this case must be inserted 2 current transformers ?<br>There the transformer coil current layout logical ? |   |                 |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 49  | 1    | I.5.21 Dual Main Relays   | This section will compare them with the latest regulations of EVN to determine exactly.   |   |                 |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 50  | 1    | I.5.28 Separation of Current Transformers for Measurement and           | This section will compare them with the latest regulations of EVN to determine exactly.   |   |                 |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |
| 51  | 1    | I.6.23. The resistance of the grounding system                          | - Adjustment formula under voltage step and touch voltage.<br>- Additional formulas K<br>- Add formula IG   | revised by VN side  |                 |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |

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|-----|------|---------------------|---|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision             | Final Solution   |                  |
| 52  | 1    | Annex II.2.1 (I.3A) | Remove all manufacturers' names mentioned in the reference. |                                     |                 |                   | JICA will confirm the revision in January. | Cao Chan will revise the contents and JICA will check the revised parts. | EVN<br>Cao       |

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| No. | Vol. | Article & Paragraph             | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion   | Responsibilities |
|-----|------|---------------------------------|--|-------------------------------------|-----------------|-------------------|---|--|------------------|
|     |      |                                 | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 1   | 3    | Chapter 5 (Earthing)            | Propose to uniform the terminologies in all over technical regulations such as: earth line, earthing wire, earthing conductor. Propose to regulate in earthing values for each equipment and each voltage level. |                                     | x               | x                 | The terminology of grounding system will be modified to be consistent as follows.<br>- Terms concerning system and works: ground(ing)<br>- Terms concerning fault: earth(ing)<br>Requirements on ground resistance are stipulated in Guideline Vol.1 (Design). Since the design of grounding system is based on IEEE standard, the values of ground resistance for each voltage level or electrical equipment are not stipulated numerically. | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 2   | 3    | Chapter 5                       | Propose to supplying contents for guideline related to power transformer.  |                                     | x               |                   | The grounding method of power transformer is stipulated in Vol.1 (Design) because the grounding method of transformer is related to design of whole grounding system.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 3   | 3    | Section 3                       | Propose to use old name of technical regulations and supplying definition of GIS in old technical regulations on Vol.1 of new regulations.   |                                     | x               | x                 | Already described GIS definition in 1.1.3. Please tell us the detailed contents of your comment.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 4   | 3    | Section 4                       | Propose to delete items 1., and 2.   |                                     | x               |                   | JICA do not understand which article are mentioned by your opinion. Please tell us the specific part.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 5   | 3    | Section 3 (page 35)             | Chapter 3 is for distribution equipments but why did its contents only relate to PT and CT?  |                                     |                 | x                 | Article 236 in the existing Vol.7 stipulates grounding work of CT and PT. therefore, this article in Guideline also stipulates grounding work of CT and PT. Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 6   | 3    | Section 4                       | Is it applied to power equipments in workshop?   |                                     | x               |                   | JICA do not understand which article are mentioned by your opinion. Please tell us the specific part.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 7   | 3    | Chapter 6 (pages from 34 to 55) | Apply to voltage lower than 1kV: no comment<br>Section 7: Install underground cable in glass tube: have not seen it yet.   |                                     | x               |                   | Please tell us the detailed contents of your comment. For your information. We do not have the materials glass tube,  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |

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| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side  | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibilities |
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|     |      |                     | Comment  | Proposed Solution for Revision   | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                  |
| 8   | 3    | Article 82          | Addition regular about minimum distance of the part have electrical which have cover insulator and install in the air  |  | x               |                   | JICA and VN side discussed this matter many times in last November and already agreed the following contents.<br>- It is not necessary for JICA to revise the technical regulation. VN side should revise it, if it is needed..<br>- JICA add the "The calculation example about short-circuit electromagnetic force between two conductors" in the GL and it is not necessary to revise GL anymore by JICA except the addition of calculation for example.<br>- JICA delete the minimum clearance table in the GL. Because this table will be provided in the GL of Vol.1(NOT in Vol.3)<br>- If VN side want to add something in the technical regulation or guideline, VN side create them and inform JICA the alternative contents. | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 9   | 3    | Article 82          | The Vietnamese version: Regulation and guide line is not compare ( Regulation discuss about mechanical, GL discuss about electrical).<br>The English version: GL have formula calculate force, so how to use this formula<br><br>Bản tiếng Việt: QC và GL không tương thích (QC nói về cơ, GL về điện).<br>Bản tiếng Anh: GL cho công thức tính lực, vậy vận dụng tính lực này vào thực tế lắp đặt thế nào? Đây là mục tiêu GL phải đạt được | Use the entire table III 2.1 and III 2.2 of the old regulations and write guidelines apply more clearly<br><br>Đưa toàn bộ bảng III 2.1 và III 2.2 của qui phạm cũ vào và viết hướng dẫn áp dụng rõ hơn. | x               |                   |  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 10  | 3    | Điều 84             | Move the last sentence to the end of table and correct sentence<br>Chuyển câu cuối xuống dưới bảng và sửa câu đó   | Each phase of the busbar and its branch must have the name<br>Mỗi pha của thanh cái và nhánh của nó phải có chỉ danh   |                 |                   | JICA agreed with VN side and this article will be modified according to this comment.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 11  | 3    | Điều 85             | Instruction must care about the expansion.<br>Chỉ dẫn cố định như thế nào để có tính đến độ giãn nở  |  | x               |                   | JICA thinks that there is no detailed contents about instruction in the GL.<br>Guideline is not a "companies manual" of work.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 12  | 3    | Điều 86             | Which method keep and anchor the busbar, busbar don't become magnetic circuit closed ?<br><br>Các biện pháp bắt giữ thanh cái không tạo thành mạch từ kín là những biện pháp nào   |  | x               | x                 | JICA didn't understand and did not modify the content of this article from the existing regulation.<br>So, please tell us the existing regulation of Vietnamese version.<br><br>Please tell us the detailed contents of your comment.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |

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|-----|------|---------------------|---|-------------------------------------|-----------------|-------------------|--------------------------------|--|--|------|
|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |  |      |
| 13  | 3    | Điều 87             | <p>Regulations: Resistance of connection terminals don't bigger busbar? The meaning not clearly.</p> <p>GL: - commentary is temperature at position connection, at table is temperature allows? Need to unite.</p> <p>- attach equipment monitor temperature of busbar → not feasible</p> <p>QC: Điện trở các đầu nối không được lớn hơn thanh cái ? không rõ nghĩa.</p> <p>GL: - Lời dẫn nói nhiệt độ tại chỗ tiếp xúc, ở bảng là độ tăng nhiệt cho phép ? Chuẩn xác lại</p> <p>- gắn thiết bị giám sát nhiệt độ thanh cái → không khả thi</p> |                                     |                 | x                 |                                | <p>JICA will explain the contents of TR next time.</p> <p>Please tell us detailed contents of your request.</p>  | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |
| 14  | 3    | Điều 90             | <p>Instruction must care about the expansion.</p> <p>Chỉ dẫn có định như thế nào để có tính đến độ giãn nở</p>  |                                     |                 | x                 |                                | <p>JICA will add the following sentence according to the agreement of WG on May.</p> <p>Consideration point for thermal expansion of the joining of the hard busbar is as follows.</p> <p>For example, when connecting hard conductors to the right angle direction, it shall be necessary to connect between hard conductors using flexible conductors to absorb the thermal expansion of hard conductors. (see the following figure)</p> | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |
| 15  | 3    | Điều 91             | <p>according with... How?</p> <p>Phù hợp với... như thế nào?</p>  |                                     |                 | x                 |                                | <p>JICA thinks that there is no detailed contents in the GL. Guideline is not a "company manual" of works.</p>   | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |
| 16  | 3    | Điều 92             | <p>which specific method protect erode?</p> <p>Name of table move to top of table</p> <p>Các biện pháp cụ thể chống ăn mòn?</p> <p>Tên bảng để lên trên bảng</p>  |                                     |                 | x                 |                                | <p>JICA will move the name of the table on top. But JICA did not understand this comment. Please tell us the detailed contents of your request.</p>  | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |
| 17  | 3    | Điều 93             | <p>Suggested to issue standard drying application ( drying temperature limit...), which doesn't exists in VN Standards, many imported devices have drying application (MC control panel, relays...) but with Vietnam environment, the temperature in the closet often higher than 50 oC</p> <p>Đề nghị cấp yêu cầu bố trí sấy (giới hạn nhiệt độ sấy...), hiện TCVN chưa có, nhiều thiết bị nhập có bố trí sấy (tủ điều khiển MC, rơle...) nhưng với môi trường VN nhiều lúc nhiệt độ trong tủ ≥ 50oC.</p>                                      |                                     |                 | x                 |                                | <p>JICA will discuss about your request next time.</p>   | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |
| 18  | 3    | Điều 95             | <p>should change article 95 content to article 96</p> <p>Nên chuyển nội dung Đ95 sang Đ96</p>   |                                     |                 | x                 |                                | <p>-JICA thinks that the contents of Article 95 is different from the Article 96.(No need to change)</p> <p>-JICA thinks that there is no detailed contents about the article 96 in the GL.(The contents of TR is enough.)</p>   | <p>Both parties agree to the reply from JICA.</p> <p>And revised the contents accordingly.</p> | MOIT |



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|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                  |
| 19  | 3    | Điều 96             | should change article 96 content of Regulation to GL<br>Nội dung Đ96 của QC nên chuyển sang GL   |                                     | x               |                   |   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 20  | 3    | Điều 97             | how long is the fixed angle doesn't change in longtime?<br>.góc đặt cố định cố định không được thay đổi trong thời gian dài dài là bao lâu?  |                                     | x               |                   | JICA will delete the word "for a long time" to clear the meaning.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 21  | 3    | Điều 98             | request to reconsider the temperature display installation at the point of the disconnecter contact<br>Đề nghị xem xét lại việc lắp chỉ thị nhiệt độ tại các điểm tiếp xúc của dao cách ly   |                                     | x               |                   | The attachment of the thermo indicator is one of methods to detect the overheat easily. (Not Mandatory)   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 22  | 3    | Điều 98             | temperature display? Does not exists in VN<br>Chỉ thị nhiệt độ? Chưa thấy có ở VN  |                                     | x               |                   | The attachment of the thermo indicator is one of methods to detect the overheat easily. (Not Mandatory)   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 23  | 3    | Điều 99             | how to reach it<br>Làm thế nào để đạt được   |                                     | x               |                   | JICA did not understand the meaning the comment.<br>Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 24  | 3    | Điều 100            | explain the abbreviations<br>Giải thích từ viết tắt  |                                     | x               |                   | JICA will add the supplemental explanation according to your comment.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 25  | 3    | Điều 101            | remove sentence "cabinets must have a key"<br>Bỏ câu Các ngăn tủ phải có chìa ...  |                                     | x               |                   | JICA did not understand it. [cabinets must have a key]<br>Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 26  | 3    | Điều 103            | 1.Vietnamese sentence<br>2.what is hard working conditions? How to know the devices can be endured ?(represented by what technical parameters?). Why the panel, which is installed in house, need endure the high speed of wind<br>1.Vietnamese sentence<br>2.what is hard working conditions? How to know the devices can be endured ?(represented by what technical parameters?). Why the panel, which is installed in house, need endure the high speed of wind |                                     |                 | x                 | This article shows about the specification of a cubicle(including outdoor).<br>So, JICA thinks that the specification "To withstand the wind pressure(equivalent to 40m/s)" is important. | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 27  | 3    | Điều 106            | request to set the range of nests, barriers<br>Đề nghị nêu rõ phạm vi áp dụng của lưới chắn, rào chắn  |                                     |                 | x                 | JICA did not understand it. JICA thinks that there are no needs to add more detail contents.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 28  | 3    | Điều 106            | what is the size of IEC 60529 nest? Sentence 2nd is have problem about grammar, repair sentence 3rd according article 108<br>kích thước lưới chắn theo IEC 60529 cụ thể là bao nhiêu? Câu thứ 2 cụt, câu thứ 3 đổi từ rào thành lưới hoặc xem lại câu này thuộc điều 108?  |                                     | x               | x                 | JICA already agreed with VN side in last November.<br>Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |

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|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution  |   |      |
| 29  | 3    | Điều 110            | why apply for only voltage to 220kV<br>Tại sao chỉ áp dụng cho điện áp đến 220kV  |                                     |                 | x                 |                                | JICA thinks there are no modification in the content of this article from the existing regulation.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 30  | 3    | Điều 112            | which is explosion compartment?<br>Ngăn phòng nổ là ngăn nào  |                                     |                 | x                 |                                | JICA didn't modify the content of this article from the existing content.<br>So, please tell us the existing content of Vietnamese version.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 31  | 3    | Điều 113            | many transformers have no wheel, so should bring them to GL<br>Nhiều MBA hiện nay không có bánh xe, cụ thể thế này thì nên chuyển vào GL  |                                     |                 | x                 |                                | According to the result of discussion on last November, Vietnamese side was supposed to develop the guideline of this article instead of JICA's content.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 32  | 3    | Điều 120            | \3.what point in GIS should check the angularity allowed range of tighten force get on where?<br>\3.Kiểm tra độ nghiêng tại chỗ nào trên GIS<br>\9. phạm vi cho phép của lực xiết lấy ở đâu   |                                     |                 | x                 |                                | JICA will modify the GL as follows.<br>In case of fastening a bolt with excessive torque, the bolt may break and the effect of spring washer is lost, therefore, the bolt shall be fastened with adequate torque specified by the manufacturer. | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 33  | 3    | Điều 121            | QC: name (time ...) and content are not clear. GL must explain how appropriate of connection<br>QC: Tên (Thời điểm...) và nội dung không rõ nghĩa. GL cần chỉ rõ nối thế nào là thích hợp   |                                     |                 | x                 |                                | JICA will modify the TR as follows.<br>At the time of unit connection, centering of the internal conductor shall be carried out so that the conductor is connected within the manufacturer's specified error under the manufacturer's orders.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 34  | 3    | Điều 123            | regulation of turn wrench<br>QC cỡ lê quay?   |                                     |                 | x                 |                                | JICA can't the modify anymore.<br>(TR and GL are not the specification of torque wrench)  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 35  | 3    | Điều 124            | Regulation: sentence 2: not clear<br>QC: Câu 2: không rõ nghĩa  |                                     |                 | x                 |                                | JICA did not understand. Please tell us the detailed your comment.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 36  | 3    | Điều 125            | \3.must say specifically: when is need to check the load temperature, does need set load speed,...?<br>\3. cần nêu cụ thể: khi nào cần kiểm tra nhiệt độ nạp, ngoài ra có cần qui định tốc độ nạp,... ?   |                                     |                 | x                 |                                | JICA did not understand. Please tell us the detailed your comment.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 37  | 3    | Điều 126            | check the air intake after or before the loading? The general level 150ppm of MC for what voltages?<br>\3. should change to article 127; the detector only can detect SF6 gas, cannot measure number of gas, so how to determine the 1% / year<br>Kiểm tra khí nạp vào nghĩa là kiểm tra khí trước khi nạp hay sau khi nạp. Mức 150ppm chung cho MC ở các cấp điện áp?<br>\3. nên chuyển sang Đ127;<br>Đầu rô chỉ xác định được có khí SF6 chứ không xác định được số lượng khí, vậy làm thế nào để xác định được 1%/năm. |                                     |                 | x                 |                                | JICA will modify Test Evaluation as follows.<br>The inspector shall confirm that a leakage gas can not be detected by gas leakage detector.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |

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|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                  |
| 38  | 3    | Điều 127            | request replace "kiểm tra độ rò khí SF6" by "kiểm tra độ rò khí SF6"<br>Đề nghị chỉnh sửa là "Kiểm tra độ rò khí SF6" thay vì "Kiểm tra độ rò khí SF6"   |                                     |                 | x                 | Please tell us the detailed contents of your comment(NOT Vietnamese).  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 39  | 3    | Điều 127            | Regulation and GL aren't the same. QC say about tight air/gas experiment, GL doesn't discuss about the test and waterproof method for the departments<br>QC và GL không thống nhất: QC nêu thí nghiệm thử kín khí-GL không hướng dẫn thí nghiệm này và biện pháp chống thấm nước cho các bộ phận |                                     |                 | x                 | JICA will add the following sentence about waterproofing.<br>Regarding the waterproofing, the caulking of the joint part of GIS tank shall be carried out using sealing materials after gas leakage test.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 40  | 3    | Điều 128            | Regulation and GL aren't compatible: GL lacks article 128, article 128 in GL is article 129 in regulation<br>QC và GL không tương thích: GL thiếu Đ128, Đ128 ở GL là Đ129 của QC   |                                     |                 | x                 | JICA thinks there are no need to additional contents. Please tell us the detailed contents of your comment.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 41  | 3    | Điều 134            | circuit breaker or knife switch? regulation is switch, GL is circuit breaker<br>Máy cắt hay cầu dao? QC là cầu dao, GL là MC   |                                     |                 | x                 | Both regulation and guideline of English version show the "circuit breaker".   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 42  | 3    | Điều 135            | Regulation: 1st sentence isn't clear<br>Title : protect people or part of electric<br>QC: câu đầu không rõ nghĩa<br>Tiêu đề: bảo vệ cho người hay cho phần mang điện   |                                     |                 | x                 | JICA didn't modify the content of this article from the existing regulation.<br>So, please tell us the existing regulation of Vietnamese version.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 43  | 3    | Điều 136            | Appropriate parameters are calculated: when to calculate, how to calculate<br>Thông số thích hợp sẽ được tính toán: khi nào tính, tính thế nào   |                                     |                 | x                 | JICA adds the calculation method utilized conventionally in Vietnam, if it is needed.<br>So, please tell us Vietnamese calculation methods.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 44  | 3    | Điều 138            | How much force is appropriate? What based on is appropriate?<br>Lực phù hợp là bao nhiêu, căn cứ nào cho là phù hợp  |                                     |                 | x                 | JICA will modify the GL as follows.<br>In case of fastening a bolt with over torque, the bolt may break and the Not expect the effects of spring washer, therefore, the bolt shall be fastened with adequate torque specified by the manufacturer. | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 45  | 3    | Điều 141            | QC: what and how are (2) insulated bar like comb<br>QC: (2) thanh cách điện hình răng lược là như thế nào  |                                     |                 | x                 | JICA did not understand. Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 46  | 3    | Điều 146            | unification using 1kv or 1000V (Regulation & GL)<br>Thống nhất dùng 1kV hay 1000V (QC & GL)  |                                     |                 | x                 | JICA will unify "1kV".   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |
| 47  | 3    | Điều 150            | Regulation: why does prescribe for only two kind batteries?<br>QC: sao chỉ quy định cho 2 loại ắc qui  |                                     |                 | x                 |  | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT             |

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|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |   |      |
| 48  | 3    | Điều 151            | Regulation is difference with GL<br>QC khác GL  |                                     |                 |                   | x                              | JICA did not understand. Please tell us the difference between TR and GL.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 49  | 3    | Mục 7               | use capacitors to increase capacity? Can use compensating capacitor?<br>Chỉ cho tụ điện để nâng công suất ? tụ bù có áp dụng được không?  |                                     |                 | x                 |                                | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 50  | 3    | Điều 160            | only apply for insulating oil paper capacitor? How about dry capacitor?<br>Chỉ áp dụng cho tụ cách điện giấy dầu ? tụ khô có áp dụng được không?  |                                     |                 | x                 |                                | There is no dry type capacitor to improve the power factor in JAPAN.<br>Therefore, JICA can't change the scope of this chapter.(JICA can't judge whether the addition is good or not.) | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 51  | 3    | Điều 161            | identify name Regulation and GL<br>Thống nhất tên QC và GL  |                                     |                 | x                 |                                | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 52  | 3    | Mục 8               | identify name Regulation and GL and replace "measurements" by "methods"<br>Thống nhất tên QC và GL và sửa Phép đo thành Biện pháp   |                                     |                 | x                 |                                |  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 53  | 3    | 65, 166, 177,       | identify name Regulation and GL<br>Thống nhất tên QC và GL  |                                     |                 |                   | x                              | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 54  | 3    | Điều 176            | the usage of word "kháng" GL:<br>Specific guidelines to know cabinet can withstand the vibration of transformer<br>Cách dùng từ "kháng"<br>GL: Hướng dẫn cụ thể để biết tủ có thể chịu được rung động của MBA | replace by " avoid vibration"       |                 |                   | x                              | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 55  | 3    | Điều 177            | Lack of illustrations<br>Thiếu hình vẽ minh họa   |                                     |                 |                   | x                              | JICA has already added the figure "Time chart of Alarm signal and indication".   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 56  | 3    | Điều 178            | the absorber...placed in coolers forced must put in house?<br>Các bình hấp thụ..... đặt ở bộ làm mát cưỡng bức phải đặt trong nhà?  |                                     |                 |                   | x                              | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 57  | 3    | Điều 179            | what temperature drying?<br>Cần sấy ở nhiệt độ nào?   |                                     |                 | x                 |                                | JICA use the existing standard Vol.3_3.2.30. But if VN need to modify, please tell us the actual operation value in Vientum.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |
| 58  | 3    | Điều 180            | Transformer in Vietnam haven't got any nitro airbag<br>MBA ở VN không có loại nào có bao giãn nở chứa Nitơ  |                                     |                 | x                 |                                | This article is moved from the article III.2.31.<br>JICA think that there is such a type of Transformer.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT |

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|     |      |                     | Comment   | Proposed Solution for Revision                    | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                  |
| 59  | 3    | Điều 181-182        | need specific content<br>Cần có nội dung cụ thể   |   | x               |                   | JICA did not understand.<br>-Please tell us the detailed contents of your request.<br>-The article 181 was moved to the article 280 of Volume 4 according to the agreement with VN.(previous VN side comments)<br>-Regarding to the article 182:The provisions of this article shall refer to the technical regulation.<br>(There is no contents to write in GL) | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 60  | 3    | Điều 184            | QC: the content isn't scope of application<br>QC: nội dung không phải Phạm vi áp dụng   |   | x               |                   | The provisions of this article shall refer to the technical regulation.<br>(There is no contents to write in GL)   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 61  | 3    | Điều 187            | QC: arrange lights follow conductor?<br>QC: bố trí đèn theo dây dẫn?  | addition GL about arrange lights follow conductor | x               |                   | JICA did not understand. Please tell us the detailed contents of your request.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 62  | 3    | Điều 212            | why use complex method like that? How about if use clamp meter measure each phase current and balance load by current load? If use the formula used in GL, so how much is a and a <sup>2</sup> (explain symbols)<br>Sao phải dùng phương pháp phức tạp vậy? dùng ampe kim đo dòng từng pha và cân tải theo dòng tải đo được có được không? Nếu dùng công thức trong GL thì a, a <sup>2</sup> cụ thể bằng bao nhiêu (giải thích ký hiệu) |   | x               |                   | This method is adopted in many countries.<br>JICA wrote a definition of VUF just for your reference.<br><br>In the actual work, The worker can measure the VUF using a clamp meter or special measuring tools(e.g. power quality monitoring tool) as your comments.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 63  | 3    | Điều 213            | what are the right methods? GL must guide to do<br>Các biện pháp phù hợp là gì? GL phải hướng dẫn thực hiện   |   | x               |                   | the following descriptions on the measures against corrosion will be added.<br>- Welded part should be painted with an antirust material.<br>- Grounding conductors should be laid on dry place.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 64  | 3    | Điều 214            | section 1: title does not match with content, the contents do not match with each other<br>Section 2: GL must guide to connect appropriate ground into which point in use<br>Mục 1: tên mục không khớp với nội dung, nội dung không khớp nghĩa với nhau.<br>Mục 2: GL cần hướng dẫn dụng dây nối đất phù hợp vào vị trí sử dụng như thế nào.  |   | x               |                   | Section 1:<br>The figure on the application range of grounding method will be added.<br><br>Section 2:<br>Since the meaning of the comment is not understandable, the contents should not be modified.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 65  | 3    | Điều 217            | content is not clear (section 3) and not match with title and match with the content of Regulation<br>5m and 4.5m are gotten in where?, these are safe distance, which depended on voltages<br>Nội dung không rõ ràng (mục 3) và không đúng với tiêu đề và không khớp với nội dung của QC.<br>Số liệu 5m và 4,5m lấy ở đâu ra, đây là những khoảng cách an toàn phải tùy thuộc vào cấp điện áp?   |   | x               |                   | Now JICA is under consideration about this comment.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 66  | 3    | Điều 218            | Title metallic wire...difficult to erode?<br>Tiêu đề<br>Mục 2. dây kim loại .... Khó bị ăn mòn?   | Section 2:<br>should add " wire earthed"          | x               |                   | Translation issue  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |

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| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibilities |
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|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                  |
| 67  | 3    | Điều 219            | <p>2. Using water pipe as earth electrode is banned in Vietnam (check the reference documentation)<br/>lc.explain</p> <p>2. Ở VN cấm dùng ống dẫn nước làm cực nối đất (kiểm tra lại tài liệu tham chiếu)<br/>lc. giải thích rõ</p>   |                                     |                 | x                 | At the article 219 in the existing Technical Regulation Vol.7, it is stipulated that water pipe can be used as grounding conductor.<br>Let us know the relevant regulation mentioned in the comment.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 68  | 3    | Điều 221            | <p>should add word "wire"<br/>nên thêm từ Dây</p>   |                                     |                 |                   | x<br>It shall be clarified where the term, "wire", is added.   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 69  | 3    | Điều 236            | <p>Request the drafters explain :<br/>is unknown usage content:<br/>sentence 1: explain the meaning<br/>sentence 2: do as design<br/>sentence 3: does not necessarily follow the above requirement(what requirements doesn't need to do follow the design?)<br/>sentence 4: can't stop<br/>Đề nghị ban soạn thảo giải thích:<br/>Nội dung không rõ hướng dẫn như thế nào:<br/>- Câu 1: giải thích ý nghĩa<br/>- Câu 2: làm theo thiết kế<br/>- Câu 3: không nhất thiết làm theo yêu cầu nói trên (yêu cầu nào hay không cần làm theo thiết kế?)<br/>- Câu 4: không ngăn chặn được</p> |                                     |                 | x                 | <p>Regarding to item 4, the 4th sentence will be deleted. Since grounding metal enclosure and iron stand is stipulated at the 2nd sentence, this modification dose not cause inconsistency in this article.<br/>The replies to others are as follows. However, such descriptions should NOT be added to Guideline in order to avoid misunderstandings.</p> <p>-- item 1:<br/>Normally, an enclosure is not energized. However, the enclosure may be energized in case that the insulation between live part and it is damaged. Therefore, the enclosure shall be grounded to avoid such voltage rise on it even if the insulation is damaged.</p> <p>-- item 2:<br/>In grounding work, the required ground resistance, grounding conductor and connection method shall be satisfied.</p> <p>-- item 3:<br/>When an enclosure is made of an insulating material, the enclosure will not be energized even if the insulation between live part and the enclosure is damaged. Therefore, in this case, grounding the enclosure is not required.</p> | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 70  | 3    | Điều 248            | <p>request to reconsider the insulated gap of ground wire from 0,75m under ground to 2m above ground<br/>Đề nghị xem xét lại khoảng cách bọc cách điện của dây dẫn tiếp đ ất từ độ sâu 0,75 m dưới mặt đất cho đến 2,0 m trên mặt đất.</p>  |                                     |                 | x                 | <p>The item 2 of this article stipulates that the purpose of cover of grounding wire is to prevent persons from touching the grounding wire.</p> <p>The length of the cover is decided based on the Japanese code.<br/>The modification of the length shall be proposed by Vietnam side.</p>   | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 71  | 3    | Điều 535            | <p>should smaller<br/>nên nhỏ hơn</p>   | <p>must bigger</p>                  |                 | x                 | JICA will discuss about your request next time.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 72  | 3    | Điều 536            | <p>sentence 1: the meaning is not clear<br/>Câu1: không rõ nghĩa</p>  |                                     |                 | x                 | JICA will discuss about your request next time.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |
| 73  | 3    | Điều 537            | <p>what are the disabilities, which exceed the permitted level ? How is exceeding the permitted level?<br/>Khuyết tật vượt quá mức cho phép là những khuyết tật gì, thế nào là quá mức cho phép</p>   |                                     |                 | x                 | JICA will discuss about your request next time.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly. | MOIT             |

#### 4. Technical Comment Table on Final draft of Guideline Vol.4 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side   | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibilities |
|-----|------|---------------------|---|---|-----------------|-------------------|--|---|------------------|
|     |      |                     | Comment   | Proposed Solution for Revision  | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                  |
| 1   | 4    | Điều 267            | monitor the load condition and threshold voltage: add "During operation, current and voltage of transformers shall be recorded once every 02 hours, the values must be within the limits of the manufacturer" |   | *               |                   | This article will be modified according to the comment.  | Vietnamese Matter   | MOIT<br>EVN      |
| 2   | 4    | Điều 267            | add : "Check outside transformer haven't abnormal noise, the terminal doesn't change color and generate heat, all of the cooling valve is open completely, oil don't leakage                                  |   | *               |                   | This article will be modified according to the comment.  | Vietnamese Matter   | MOIT<br>EVN      |
| 3   | 4    | Điều 267            | the arrow display the highest temperature must be returned  | Explain clearly   | *               |                   | This article will be modified according to the comment.  | Vietnamese Matter   | MOIT<br>EVN      |
| 4   | 4    | Điều 267            | but threshold voltage   | ...and voltage lever  |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 5   | 4    | Điều 267            | regarding control the quality of oil : section 1 and section 2  | not compare with English version. In here, want recommend use "mineral oil" ? In Vietnamese version haven't table | *               |                   | Please tell us the detailed contents of your comment.  | Revise table267   | MOIT<br>EVN      |
| 6   | 4    | Điều 267            | after section 3   | section 4, not section 1  |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 7   | 4    | Điều 267            | after section 3   | Switching pattern can't translate to" chuyển đổi các quá trình"   |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 8   | 4    | Điều 268            | opinion 3   | Explain about electrical source supply SW   |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 9   | 4    | Điều 268            | opinion 4: drainage pump  | leakage pump  |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 10  | 4    | Điều 268            | opinion 5: pump   | one word"drainage pump" but translate differce  |                 | *                 | Translation issue  | Vietnamese Matter   | MOIT<br>EVN      |
| 11  | 4    | Điều 271            | add : "in case , operator OLTC many time, must test oil in the regulator voltage  |   | *               |                   | JICA will add the sentence as follows according to your request.<br>The insulation oil of on-load tap changer deteriorates due to the switching operation in the oil, so the breakdown voltage test shall be carried out periodically. | Both parties agree to the reply from JICA.<br>Delete table271 | MOIT<br>EVN      |
| 12  | 4    | Điều 271            | distribution transformer  | Need discuss again, this is general transformer or distribution transformer                                       | *               |                   | JICA did not understand is. Please tell us the detailed contents of your comment.  | And revised the contents accordingly.                         | MOIT<br>EVN      |

#### 4. Technical Comment Table on Final draft of Guideline Vol.4 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side         | Classification  |                   | Result of Review by JICA side   | Conclusion  | Responsibilities |
|-----|------|---------------------|--|---|-----------------|-------------------|---|---|------------------|
|     |      |                     | Comment  | Proposed Solution for Revision              | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                  |
| 13  | 4    | Điều 274            | replace by the follow content: "TIn the process of nomar operation, oil lever of auxiliary oil tank transformer must appropriate with temperature of environment and characteristics of manufacturers. In case oil lever decrease, level 1 is alarm, level 2 is trip."→レベル2は無い |   | *               |                   | JICA will modify the sentence as follows according to your request.<br>In normal operation, insulation oil in conservator of transformer shall be at the level equal to the corresponding oil temperature in transformers, which specified by the manufacturer.<br>If the oil leakage occurs and the oil level decreases due to something trouble, it shall be necessary to give a warning at the oil level 1 and to trip the transformer at the oil level 2. | Both parties agree to the reply from JICA.<br>And revised the contents accordingly.                                     | MOIT<br>EVN      |
| 14  | 4    | Điều 274            | describing in Vietnamese is bad  |   |                 | *                 | Translation issue   | Vietnamese Matter   | MOIT<br>EVN      |
| 15  | 4    | Điều 275            | no content   | Request addition content, this is important | *               |                   | Although actual overload limit and duration of transformer shall be based on the operation manual and instructions of manufacturer as shown in the technical regulation, JICA will provide "the overload operation of transformer, the current and temperature limitations" of IEC just for reference in the GL.  | Both parties agree to the reply from JICA.<br>And revised the contents accordingly.                                     | MOIT<br>EVN      |
| 16  | 4    | Điều 277            | add : "When checking oil quality detection of impurities greater than prescribed in the regulations, must stop operation immediate".   |   | *               |                   | JICA will add the sentence as follows according to your request.<br>Especially, if acetylene or ethylene gas generated by the arc or partial discharge inside of the transformer is detected, it shall stop the operating immediately.  | Added IEC60599 , IEEE C57.104-2008<br>it shall stop the operating immediately. → it shall stop the operating if needed. | MOIT<br>EVN      |
| 17  | 4    | Điều 278            | transformer energization   | transformer energization again              |                 | *                 | Translation issue   | Vietnamese Matter   | MOIT<br>EVN      |
| 18  | 4    | Điều 279            | lack picture   |   | *               |                   | MICA has already added the figure of conservator.   | Vietnamese Matter   | MOIT<br>EVN      |
| 19  | 4    | Điều 298            | during the normal operation, battery system is only automatically separated from the operation when the current is over. Remove : "condition system control fault , over voltage fault"  |   | *               |                   | JICA will delete the following trip condition according to your request<br>(1) When overvoltage occurs in the battery<br>(3) When abnormality occurs in the control unit  | Delete  | MOIT<br>EVN      |



#### 4. Technical Comment Table on Final draft of Guideline Vol.4 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion   | Responsibilities |
|-----|------|---------------------|--|-------------------------------------|-----------------|-------------------|---|--|------------------|
|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 20  | 4    | Điều 300            | can install and operate both of acid battery platform and alkaline battery platform into a same cabinet? |                                     | *               |                   | <p>JICA doesn't recommend the installation of lead acid and alkaline battery in the same cabinet and operation. Because of the following reason.</p> <p>If both lead acid and alkaline battery were installed in the same cabinet, acid mist and alkaline mist would occur in the cabinet during charging process. That will cause something trouble.</p> <p>And it is difficult to charge the lead acid cell and alkaline cell by same rectifier at the same time. Because the standard cell voltage is different.</p> | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT<br>EVN      |
| 21  | 4    | Điều 300            | add the regulation of lights in battery, fire regulations  |                                     | *               |                   | JICA did not understand it. Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT<br>EVN      |
| 22  | 4    | Điều 301            | ...restricted earth fault protection   | Explain clearly                     | *               |                   | JICA did not understand it. Please tell us the detailed contents of your comment.   | No need to revise  | MOIT<br>EVN      |
| 23  | 4    | Điều 366            | The power company will inspect Dispatch system   | not as decentralized                | *               |                   | JICA did not understand it. Please tell us the detailed contents of your comment.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | MOIT<br>EVN      |
| 24  | 4    | Điều 370            | from 220kV   | 220kV above                         | *               |                   | JICA wrote "220kV or more" originally.  | No need to revise  | MOIT<br>EVN      |

### 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion   | Responsibilities |
|-----|------|---------------------|--|-------------------------------------|-----------------|-------------------|---|--|------------------|
|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution   |                  |
| 1   | 5    | 23                  | <p>Applied voltage for measurement of insulation resistance (Megameter) in Guideline Vol.5 is different from actual applied voltage in Vietnam.</p> <p>Actual applied voltages are as below.</p> <ul style="list-style-type: none"> <li>- Up to 1kV : 500V or 1000V</li> <li>- 6,10,22,35 or 110kV : 2500V</li> <li>- 220 or 500kV : 2500V or 5000V</li> </ul> |                                     | *               |                   | <p>JICA will write applied voltages in Guideline Vol.5 as below, which are based on article 4.3 of "Electrical cable test procedures (Procedures code 09-05)" issued by EVN.</p> <ul style="list-style-type: none"> <li>- Up to 1kV : 500V or 1000V</li> <li>- Exceeding 1kV : 1000V or 2500V</li> <li>- 6.6kV or higher : 2500V or 5000V</li> </ul> <p>But, the above mentioned values are different from your suggestion. So, JICA would like to discuss which values are better to write.</p>  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 2   | 5    | 26-a1               | <p>Withstand voltage test for cables is implemented based on IEC 60502-1 and 2.</p> <p>Test time is 15 minutes.</p> <p>Phase voltage is 4U0.</p>   |                                     | *               |                   | <p>JICA revised withstand voltage test to DC high voltage test in this article.</p> <p>Because EVN requested JICA to write DC high voltage test about power cables based on article 4.6 of "Electrical cable test procedures (Procedures code 09-05)" issued by EVN.</p> <p>So, JICA would like to ask ETC to confirm that there is no problem to write above contents in this article.</p>   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 3   | 5    | 27                  | <p>Item 2</p> <p>The applying voltages of insulation-resistance meter are not the same as Vietnamese standard.</p>   |                                     | *               |                   | <p>JICA described the applying voltage of insulation-resistance meter according to Japanese standard, however we will modify it with reference to Vietnamese standard. We want to know the details of Vietnamese standard and to discuss about the criteria in the next meeting.</p>  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 4   | 5    | 27                  | <p>Item 6</p> <p>Please delete the description about measurement of no-load current and loss of transformer, because it is difficult to execute on-site.</p>   |                                     | *               |                   | <p>With respect to measurement of no-load current and loss of transformer, JICA also thinks it is difficult to execute the test on-site, because to apply rated voltage is needed for this test (So, we suggested that the test shall not be regulated in the technical regulation). However, it is decided to keep the description by Vietnamese strong request in the work shop held in June 2011.</p> <p>At present, we can not change the content of technical regulation (deletion of this test is difficult). So, we would like to discuss the detailed description of guideline in the next meeting.</p> <p>--&gt; Modified GL.(tentative):If the implementation of the test by applying rated voltage is difficult, it is possible to change the test conditions in consultation with the manufacturer.</p> | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |

### 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibilities |
|-----|------|---------------------|--|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |                     | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution   |                  |
| 5   | 5    | 27                  | Item 8-(1)-2), 3)<br>Please delete the description about measurement of drive torque and current-limiting resistance of OLTC, because it is difficult to execute on-site.  |                                     | *               |                   | With respect to measurement of drive torque and current-limiting resistance of OLTC, JICA think these tests are not mandatory but voluntary. So we propose to add the provision "if it is necessary" in the guideline.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 6   | 5    | 27                  | Item 11<br>Please modify the description about withstand voltage test.   |                                     | *               |                   | JICA will describe the provision with reference to Vietnamese standard.<br>JICA sẽ mô tả nội dung nêu phù hợp với tiêu chuẩn Việt Nam  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 7   | 5    | 28                  | Item 2<br>Same comment as No.3   |                                     | *               |                   | Same comment as No.3   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 8   | 5    | 28                  | Item 2-(3)<br>Please modify the description as below.<br>"The dielectric loss angle (tan delta) for coupling condenser of bushing" --> "The dielectric loss angle (tan delta) and capacitance coupling condenser of bushing" |                                     | *               |                   | JICA will modify the description as Vietnamese proposal.<br>"The dielectric loss angle (tan delta) for coupling condenser of bushing" --> "The dielectric loss angle (tan delta) and capacitance coupling condenser of bushing"  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 9   | 5    | 30                  | Item 2-(1)<br>Please modify the description because it is difficult to understand.   |                                     | *               |                   | JICA want to discuss about the amendment of this provision in next meeting.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 10  | 5    | 30                  | Item 2-(2)<br>Same comment as No.3   |                                     | *               |                   | Same comment as No.3   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |
| 11  | 5    | 30                  | Item 3<br>Please check the content in comparison with IEC60694.  |                                     | *               |                   | According to IEC60694, the direct current to measure the contact resistance of CB is "more than 50A". However, to apply more than 50A on-site may be difficult. So, JICA recommend "more than 10A" which is the standard in Japan. Of course, JICA will be willing to modify the description to "more than 50A", if Vietnamese side hopes. | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC              |

### 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion   | Responsibilities   |     |
|-----|------|---------------------|---|-------------------------------------|-----------------|-------------------|--------------------------------|--|--|-----|
|     |      |                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision | Final Solution   |  |     |
| 12  | 5    | 30                  | Item 6 Table 30-2<br>Please check the content in comparison with IEC60694.  |                                     |                 | *                 |                                | According to IEC60694 and IEC62271-1, the minimum operating voltage of CB is 85% of rated voltage. It is the same as Table 30-2.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |
| 13  | 5    | 30                  | Item 6 Table 30-4<br>Please check the content. The criteria are severe.   |                                     |                 | *                 |                                | JICA want to discuss about the amendment of this provision in the next meeting.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |
| 14  | 5    | 37                  | Item 2-(3)<br>Please delete the description about measurement of tan delta, because it is difficult to execute on-site. |                                     |                 | *                 |                                | With respect to measurement of tan delta of power capacitor, JICA also think it is difficult to execute the test on-site because to apply rated voltage is needed for this test.<br><br>However, as stated in No.4, we can not change the content of technical regulation (deletion of this test is difficult). So, we would like to discuss the detailed description of guideline in next meeting.<br>--> Modified GL.(tentative):If the implementation of the test by applying rated voltage is difficult, it is possible to change the test conditions in consultation with the manufacturer. | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |
| 15  | 5    | 37                  | Item 5<br>Please check the content.   |                                     |                 | *                 |                                | There is no description about withstand voltage test on-site for power capacitor in related IEC. JICA think ON-SITE TEST is different from FACTORY TEST.<br>(Almost all dielectric tests (withstand voltage tests) for every equipment regulated in IEC are supposed to be carried out in the factory NOT on-site.)<br><br>But if some descriptions about the test are already regulated in Vietnamese standard (like transformer), JICA will add the provision.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |
| 16  | 5    | 38                  | Item 2-(1)<br>Is it necessary the measurement of insulation resistance of main circuit?                                 |                                     |                 | *                 |                                | Measurement of insulation resistance of main circuit of surge arrester is effective to know approximate state of deterioration. So, JICA recommend this test as an auxiliary one of measurement of leakage current.  | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |
| 17  | 5    | 38                  | Item 2-(2)<br>Is it necessary the measurement of insulation resistance of insulation base?                              |                                     |                 | *                 |                                | With respect to measurement of insulation resistance of insulation base, JICA kept the description according to old Vietnamese Regulation. If it is not necessary, JICA will delete the description.   | Both parties agree to the reply from JICA. And revised the contents accordingly. | ETC |

### 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph         | Result of Review by VN Side or JP Side   | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side   | Conclusion  | Responsibilities |
|-----|------|-----------------------------|--|-------------------------------------|-----------------|-------------------|---|---|------------------|
|     |      |                             | Comment  | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision  | Final Solution  |                  |
| 18  | 5    | 38                          | Item 2-(2)<br>Please check the content.  |                                     | *               |                   | Same comment as No.3  | Both parties agree to the reply from JICA. And revised the contents accordingly.  | ETC              |
| 19  | 5    | 38                          | Item 4<br>Please check the content in comparision with IEC60099-4.   |                                     | *               |                   | According to the subclause 11.10 of IEC60099-4, withstand voltage test is not specified in the test after erection on-site.   | Both parties agree to the reply from JICA. And revised the contents accordingly.  | ETC              |
| 20  | 5    | Article 37                  | Request to add content of a big amount of electrical wire and cable reel that can be left outdoor  |                                     | *               |                   | Electrical wires and cables should be stored indoor. The table37 will be modified from this viewpoint.  | Both parties agree to the revision proposed by JICA.  | ETC              |
| 21  | 5    | Article 300. Ventilation    | In order to evacuate hydrogen gas generated from the battery during the charge and discharge process, it is necessary to install the ventilation system in battery room of the power plant and the substation according to the installation criteria provided in the local regulations and the guidelines in the Article 156 of section 6 of chapter 3 in the volume 3.<br><br>Base on battery type and follow manufacture's instruction to absorb Hydrogen generated from the battery during charging and discharging process, install the ventilation system for battery room in compliance with the local management unit's regulation and guideline, article 156 part 6 chapter 3 Vol 3; |                                     | *               |                   | JICA agree to change this sentence as proposed by VN side.<br><br>Based on battery type, manufacture's instruction should be followed to vent hydrogen generated from the battery during charging and discharging process. Ventilation system should be installed at battery room in accordance with manufacture's instruction, the local management unit's regulation and Guideline, article 156 part 6 chapter 3 Vol 3. | Basically, both parties agree to JICA's proposal.<br>In order to clarify the meaning of the content, the proposed description will be modified as follows.<br><br>"Based on battery type, manufacture's instruction should be followed to vent hydrogen generated from the battery during charging and discharging process. Ventilation system should be installed at battery room in accordance with manufacture's instruction, the local management unit's regulation and Guideline, article 156 part 6 chapter 3 Vol 3." | ETC              |
| 22  | 5    | Article 27                  | 1 - Recommend to add the following content: " Insulating oil inspection" and change related items in other chapters. Ch-7  |                                     | *               |                   | JICA will modify only the specific values of standards. However, the composition of Guideline should not be modified. Accordingly, new chapter (Chapter 7) will not be added.   | Both parties agree to the reply from JICA.  | ETC              |
| 23  | 5    | Article 27                  | 2 - Some of values in Guideline are very strict, this will cause bad impact for economical factor if we apply them; for example: in Table 27-7, "humidity content of insulating oil for transformer with voltage over 110kV must be < 5ppm, for transformer with voltage over 35kV < 10ppm", these numbers taken from IEC 60422. However, these values conflict and are more strict than those in IEC 60422 as well.   |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.  | The relevant part will be revsed according to EVN manual.   | ETC              |
| 24  | 5    | Table 3, article 9, page 45 | IEC 60422 indicates the humidity content of oil required before enegization in table 3; This part, previously, has been edited completely by EVN in reference with values described in IEC, Russian, Chinese documents ... So, this part should be incorporated in Technical Regulation Vol. 5   |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.  | The relevant part will be revsed according to EVN manual.   | ETC              |

## 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph   | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion  | Responsibilities |
|-----|------|-----------------------|---|-------------------------------------|-----------------|-------------------|--|---|------------------|
|     |      |                       | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution  |                  |
| 25  | 5    |                       | this issue needs further consideration: Standard for transformer oil before operation, item 8, total of dissolved gas content of 110kV transformer is ≤ 4% (it is 2% in the draft of EVN, the value of 4% will conflict to the existing Vol. 5). Moreover, if we apply the value of 2% then 90% of current operating transformer "will not meet the requirement for operation", we think that no country in the world apply this. |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.   | The relevant part will be revised according to EVN manual.  | ETC              |
| 26  | 5    | Chapter 4- Article 27 | Inspection items for Power Transformer: Silica gel is used to dehumidify the oil of transformer, its color will be checked periodically, if the color changes silica gel will have to be changed.   |                                     | *               |                   | The requirements on inspection of silica gel has been already described in Item 1 of Article 27.   | Additional description is not necessary according to JICA's reply.  | ETC              |
| 27  | 5    | Chapter 4- Article 27 | Chapter 4 - Article 27 Inspection items of power transformer: add the regulation on dry type transformer corresponding to oil filled transformer  |                                     | *               |                   | Additional description on insulation resistance for dry-type transformer will be added.  | According to request from VN side, it will be clarified that inspection on dry-type transformer should be executed in accordance with the requirement and procedure of inspection on oil-immersed transformer. (JICA will check the contents of IEEE C57.12.91 for Dry Transformer) | ETC              |
| 28  | 5    | Chapter 4- Article 27 | Chapter 4 - Article 27 Addition requires for Inspection items of power transformer, post installation: earthing system for magnetic core, laminated core.   |                                     | *               |                   | This inspection is applied to special cases. Therefore, such inspection should not be described in Guideline.  | Additional description is not necessary according to JICA's reply.  | ETC              |
| 29  | 5    | Chapter 4- Article 27 | Chapter 4 - power substation equipment - post installation inspection: Addition requires for Inspection of earthing system of the station, regulation on values of earthing resistant for 110kV, 220kV.   |                                     | *               |                   | The inspection on earthing system of substation has been already described in Article 51.  | Additional description is not necessary according to JICA's reply.  | ETC              |
| 30  | 5    | Chapter 4- Article 27 | Chapter 4 - power substation equipment - post installation inspection: Addition requires for Inspection items of fire protection for power substation.  |                                     | *               |                   | Fire prevention measures for a substation have been already described in Articles I.4.33 and I.4.46 of Guideline Vol.1.  | Additional description is not necessary according to JICA's reply.  | ETC              |
| 31  | 5    | Chapter 4- Article 27 | Chapter 4 - power substation equipment - post installation inspection of transformer equipment: addition requires for inspection interval (time limit) of transformer oil sample extraction to test.  |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.   | Both parties agree to the reply from JICA.  | ETC              |
| 32  | 5    | Chapter 4- Article 30 | Chapter 4 - power substation equipment - post installation inspection, periodic inspection: addition requires for inspection items of insulation resistance of motor of circuit breaker.  |                                     | *               |                   | The inspection on insulation resistance of motor has been already included in the item 2 of this article. The description in the item2 will be modified as follows. "Insulation resistance of control circuits (including the motor) shall be measured by a 500V or 1,000V insulation-resistance meter." | Both parties agree to modification proposed by JICA<br>The term, "insulation-resistance meter" will be modified to the one, "megger".   | ETC              |

### 5. Technical Comment Table on Final draft of Guideline Vol. 5 (Network Part)

| No. | Vol. | Article & Paragraph                 | Result of Review by VN Side or JP Side  | Result of Review by Vietnamese side | Classification  |                   | Result of Review by JICA side  | Conclusion                                 | Responsibilities |
|-----|------|-------------------------------------|---|-------------------------------------|-----------------|-------------------|--|--|------------------|
|     |      |                                     | Comment   | Proposed Solution for Revision      | Technical issue | Translation issue | Proposed Solution for Revision   | Final Solution                             |                  |
| 33  | 5    | Article 26-a2                       | Article 26-a2: Status oil insulated cables (OF) must be checked to ensure the specification matches the technical requirements mentioned in Chapter 7.                        |                                     | *               |                   | The requirement on in-progress inspection for the insulation oil of oil-filled cables will not be added because oil-filled cables are not adopted in future in Vietnam.  | Both parties agree to the reply from JICA. | ETC              |
| 34  | 5    | Article 27                          | Electrical insulation of transformer insulating oil should be checked before and after filling to ensure characteristics in accordance with standards mentioned in Chapter 7. |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.   | Both parties agree to the reply from JICA. | ETC              |
| 35  | 5    | Article 27                          | 3) Status insulation OLTC oil must be checked to ensure the specification matches the technical requirements mentioned in Chapter 7.  |                                     | *               |                   | ditto  | Both parties agree to the reply from JICA. | ETC              |
| 36  | 5    | Article 64                          | The test item analysis of the cable insulation oil must be carried out in accordance with the technical requirements mentioned in Chapter 7.                                  |                                     | *               |                   | The requirement on periodic inspection for the insulation oil of oil-filled cables will be modified as follows.<br>"The inspection of insulation oil for oil-filled cable shall be based on instruction manual of manufacturer." | Both parties agree to the reply from JICA. | ETC              |
| 37  | 5    | Article 65                          | Electrical insulation of transformer insulating oils are tested and confirmed to ensure the standards in chapter 7.   |                                     | *               |                   | JICA will revise the standards of insulation oil for transformers according to EVN manual.   | Both parties agree to the reply from JICA. | ETC              |
| 38  | 5    | Article 65/<br>Item 5 (pages 63-64) | Refer to Chapter 7  |                                     | *               |                   | ditto  | Both parties agree to the reply from JICA. | ETC              |
| 39  | 5    | Article 71/<br>Item 6 (page 68)     | Insulating characteristic of the insulating oil in the circuit breaker will be examined and confirmed the standards mentioned in Chapter 7                                    |                                     | *               |                   | JICA will revise the standards of insulation oil for oil circuit breaker according to proposal from VN side.   | Both parties agree to the reply from JICA. | ETC              |
| 40  | 5    | Article 27                          | Insulating oil are received from suppliers are once test and test items must meet quality standards of oil in Table 75.   |                                     | *               |                   | Revision according to the comment will be added in item 7 (1) of article 27.   | Both parties agree to the reply from JICA. | ETC              |

## **Appendix-8**

### **Record of Project Input**

- 8.1 Dispatch of Japanese Experts**
- 8.2 Provision of Equipment by Japanese Side**
- 8.3 Local cost borne by Japanese side**
- 8.4 Input of Counterparts by Vietnamese Side**



## Appendix 8.1 Dispatch of Japanese Experts

| Name         |           | Assignment                                      | Period  | Office affiliated                              | 1st ST MM | 2nd ST MM | Total MM |
|--------------|-----------|---|---|--|-----------|-----------|----------|
| (Long-term)  |           |   |   |  |           |           |          |
| SHIGERU      | NAKAMURA  | Team Leader / Hydropower Expert A               | (1st Stage)<br>10.3.9~10.3.23<br>10.6.2~10.9.19<br>10.10.7~10.11.9<br>10.12.1~11.4.2<br>11.4.17~11.6.4<br>11.6.19~11.7.7<br>(2nd Stage)<br>11.10.6~11.12.24<br>12.1.8~12.3.31<br>12.4.11~12.6.9<br>12.7.8~12.9.15<br>12.9.27~12.11.10<br>12.11.25~13.2.7<br>13.2.26~13.4.30<br>13.5.19~13.6.8 | Electric Power Development Co., Ltd. (J-Power) | 10.90     | 14.77     | 25.67    |
| (Short-term) |           |   |   |  |           |           |          |
| YUTARO       | MIZUHASHI | Hydropower Expert B (Civil Works)               | (1st Stage)<br>10.3.13~10.3.21<br>10.6.21~7.14<br>10.10.7~10.30<br>11.3.3~3.17<br>11.6.19~7.16<br>(2nd Stage)<br>11.11.10~11.23<br>12.5.13~12.5.19<br>12.7.8~12.7.21<br>12.10.22~12.11.7<br>13.1.6~13.1.19<br>13.3.27~13.3.30<br>13.4.21~13.4.30<br>13.6.3~13.6.7                             | Electric Power Development Co., Ltd. (J-Power) | 3.00      | 2.83      | 5.83     |
| SHUJI        | UMESAKI   | Hydropower Expert C (Hydromechanical Equipment) | (1st Stage)<br>10.6.21~7.14<br>10.10.10~10.19<br><br>11.3.3~3.17<br>11.6.19~7.6<br>(2nd Stage)<br>11.11.14~11.22<br>12.5.6~12.5.19<br>12.7.8~12.7.14<br>12.10.23~12.11.6<br>13.1.9~13.1.19<br>13.4.10~13.4.13   | Electric Power Development Co., Ltd. (J-Power) | 2.23      | 2.00      | 4.23     |
| MOTOTARO     | OKADA     | Hydropower Expert D (Electrical Works)          | (1st Stage)<br>10.3.13~3.2<br>10.6.2~6.12<br>10.10.10~11.2<br>11.3.3~3.17<br>11.6.19~7.6<br>(2nd Stage)<br>11.11.13~11.23<br>12.5.6~12.5.19<br>12.7.15~12.7.21<br>12.10.21~12.11.3<br>13.1.6~13.1.19<br>13.4.17~13.4.26<br>13.6.3~13.6.7  | Electric Power Development Co., Ltd. (J-Power) | 2.57      | 2.50      | 5.07     |
| YOSHIO       | OOYAMA    | Thermal Power Expert A (Mechanical Equipment A) | (1st Stage)<br>10.3.13~3.21<br>10.6.21~7.29<br>10.10.10~11.2<br>11.2.22~3.17<br>11.6.19~7.6<br>(2nd Stage)<br>11.11.12~11.25<br>12.5.6~12.5.23<br>12.8.22~12.9.7<br>12.10.21~12.11.7<br>13.1.20~13.2.5<br>13.4.17~13.4.26<br>13.6.3~13.6.8  | West Japan Engineering Consultants, Inc.       | 3.80      | 3.33      | 7.13     |
| HIROAHI      | IMAMURA   | Thermal Power Expert B (Electrical Works A)     | (1st Stage)<br>10.3.13~3.21<br>10.6.21~7.29<br>10.10.12~10.23<br>11.3.3~3.17<br>11.6.19~7.6<br>(2nd Stage)<br>11.11.17~11.11.25<br>12.10.22~12.11.3<br>13.1.20~13.2.2<br>13.4.17~13.4.26  | West Japan Engineering Consultants, Inc.       | 3.10      | 1.53      | 4.63     |

## Appendix 8.1 Dispatch of Japanese Experts

| Name                           | Assignment   | Period   | Office affiliated                           | 1st ST MM | 2nd ST MM | Total MM |
|--------------------------------|--|--|---|-----------|-----------|----------|
| MASAAKI                        | KOGA<br>Thermal Power Expert C<br>(Mechanical Equipment B) | (1st Stage)<br>10.6.21-10.7.14<br>10.10.10-11.2<br>11.2.22-3.17<br>11.6.19-7.6<br>(2nd Stage)<br>11.11.13-11.26<br>12.5.6-12.5.23<br>12.8.22-12.9.7<br>12.10.21-12.11.7<br>13.1.20-13.2.5<br>13.4.17-13.4.26<br>13.6.3-13.6.8              | West Japan Engineering<br>Consultants, Inc. | 3.00      | 3.33      | 6.33     |
| TAKASHI                        | EGASHIRA<br>Thermal Power Expert D<br>(Electrical Works B) | (1st Stage)<br><br>(2nd Stage)<br>12.5.9-12.5.22<br>12.8.29-12.9.7   | West Japan Engineering<br>Consultants, Inc. | 0.00      | 0.80      | 0.80     |
| KENICHI                        | KUWAHARA<br>Network Expert A<br>(Transmission System)      | (1st Stage)<br>10.3.13-3.21<br>10.6.21-7.29<br>10.10.7-10.30<br>11.2.22-3.17<br>11.6.20-7.7<br>(2nd Stage)<br>11.11.8-11.19<br>12.4.23-12.4.28<br>12.5.8-12.5.19<br>12.7.23-12.8.5<br>12.10.21-12.11.3<br>13.4.17-13.4.27<br>13.6.2-13.6.8 | Shikoku Electric Power Co., Inc.            | 3.80      | 2.53      | 6.33     |
| TOSHIO                         | AKI<br>Network Expert B<br>(Substation System)             | (1st Stage)<br>10.3.14-3.21<br>10.6.20-7.29<br>10.10.10-11.2<br>11.3.8-3.16<br>11.5.4-11.5.18<br>11.6.19-7.6<br>(2nd Stage)<br>11.11.21-12.3<br>12.2.5-12.2.8<br>12.7.8-7.21<br>12.7.29-12.8.11<br>12.10.21-12.11.3<br>13.1.13-13.1.26     | Shikoku Electric Power Co., Inc.            | 3.80      | 2.43      | 6.23     |
| YOSHITETSU                     | FUJISAWA<br>Network Expert C<br>(Distribution System)      | (1st Stage)<br>10.6.21-7.3<br>10.10.7-10.30<br>(2ns Stage)<br>-  | Shikoku Electric Power Co., Inc.            | 1.23      | 0.00      | 1.23     |
| TSUGUHIRO                      | YAMADA<br>Network Expert C<br>(Distribution System)        | (1st Stage)<br>11.5.4-5.17<br>11.6.19-7.6<br>(2nd Stage)<br>11.11.8-11.12<br>12.5.8-12.5.19<br>12.8.26-12.9.1<br>12.10.21-12.10.31<br>13.1.13-13.1.26<br>13.4.12-13.4.27<br>13.6.2-13.6.8  | Shikoku Electric Power Co., Inc.            | 1.07      | 2.40      | 3.47     |
| TAKAYOSHI                      | MASUDA<br>Network Expert D<br>(Grounding System)           | (1st Stage)<br>10.6.20-7.13<br>10.10.10-10.21<br>11.3.3-11.3.17<br>11.6.19-7.6<br>(2nd Stage)<br>11.14-11.25<br>12.5.8-12.5.19<br>12.7.8-12.7.17<br>12.10.21-12.11.3<br>13.4.15-13.4.19  | Shikoku Electric Power Co., Inc.            | 2.30      | 1.77      | 4.07     |
| SHIGEO                         | FUJINO<br>Network Expert E<br>(Inspection)                 | (1st Stage)<br>-<br>(2nd Stage)<br>12.5.8-12.5.19<br>12.8.26-12.9.1<br>-   | Shikoku Electric Power Co., Inc.            | 0.00      | 0.63      | 0.63     |
| KENICHI<br>TAKAYOSHI<br>TOSHIO | KUWAHARA<br>MASUDA<br>AKI<br>Network Support               | (1st Stage)<br>-<br>(2nd Stage)<br>12.9.10-12.9.15<br>12.12.12-12.12.20<br>13.1.14-13.1.26<br>13.3.7-13.3.15<br>13.4.12-13.4.28<br>13.5.19-13.5.25   | Shikoku Electric Power Co., Inc.            | 0.00      | 2.03      | 2.03     |
| Total MM                       |  |  |   | 40.80     | 42.88     | 83.68    |

## Appendix 8.2 Provision of Equipment by Japanese Side

### JFY 2009 (JPY) Hand Carried Equipment

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

### JFY 2010 (JPY) Hand Carried Equipment

| Date               | Item                | Unit Amount | Unit | Cost           |
|--------------------|---------------------|-------------|------|----------------|
| June 4, 2010       | EPSON LCD Projector | 117,000.00  | 1    | 117,000        |
| <b>Total (JPY)</b> |                     |             |      | <b>117,000</b> |

### JFY 2011 (JPY) Hand Carried Equipment

| Date               | Item                | Unit Amount | Unit | Cost           |
|--------------------|---------------------|-------------|------|----------------|
| November 30, 2011  | EPSON LCD Projector | 128,000.00  | 2    | 256,000        |
| <b>Total (JPY)</b> |                     |             |      | <b>256,000</b> |

### JFY 2012 (JPY)

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

373,000

### JFY 2009 (VND) Locally Purchased Equipment

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (VND)</b> |      |             |      | <b>0.00</b> |

### JFY 2010 (VND) Locally Purchased Equipment

| Date               | Item       | Unit Amount   | Unit | Cost              |
|--------------------|------------|---------------|------|-------------------|
| July 20, 2010      | Desktop PC | 42,439,000.00 | 1    | 42,439,000        |
| <b>Total (VND)</b> |            |               |      | <b>42,439,000</b> |

### JFY 2011 (VND) Locally Purchased Equipment

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (JPY)</b> |      |             |      | <b>0.00</b> |

### JFY 2012 (VND) Locally Purchased Equipment

| Date               | Item | Unit Amount | Unit | Cost        |
|--------------------|------|-------------|------|-------------|
|                    | NA   |             |      | 0.00        |
| <b>Total (VND)</b> |      |             |      | <b>0.00</b> |

## Appendix 8.3 Local cost borne by Japanese side

(Unit: JPY '000)

|                                | 1st Stage     | 2nd Stage     | Total         |
|--------------------------------|---------------|---------------|---------------|
| <b>General activity budget</b> |               |               |               |
| (1) General Activities         | 8,408         | 19,360        | <b>27,768</b> |
| (2) Local Consultant Contracts | 13,996        | 23,221        | <b>37,217</b> |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
|                                |               |               |               |
| <b>Total</b>                   | <b>22,404</b> | <b>42,581</b> | <b>64,985</b> |

## Appendix 8.4 Input of Counterparts by Vietnamese Side

| FULL NAME                               |                   | ORGANIZATION   | POSITION  |
|---|-------------------|--|---|
| <b>JCC Members</b>                      |                   |  |   |
| 1                                       | Nguyen Dinh Hiep  | Science and Technology Dept.- MOIT   | Director  |
| 2                                       | Phuong Hoang Kim  | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Director (until March 2012)   |
| 3                                       | Phan Cong Hop     | Science and Technology Dept.- MOIT   | Deputy Director   |
| 4                                       | Dang Hai Dung     | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 5                                       | Nguyen Duy Hoa    | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 6                                       | Tran Huu Ha       | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 7                                       | Dang Hoang An     | EVN  | Deputy Director General of EVN  |
| <b>JMC Members</b>                      |                   |  |   |
| 8                                       | Nguyen Dinh Hiep  | Science and Technology Dept.- MOIT   | Director  |
| 9                                       | Phuong Hoang Kim  | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Director (until March 2012)   |
| 10                                      | Phan Cong Hop     | Science and Technology Dept.- MOIT   | Deputy Director   |
| 11                                      | Dang Hai Dung     | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 12                                      | Nguyen Duy Hoa    | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 13                                      | Tran Huu Ha       | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 14                                      | Dang Hoang An     | EVN  | Deputy Director General of EVN  |
| <b>WG Members (Hydropower Group-1)</b>  |                   |  |   |
| 15                                      | Tran Viet Hoa     | Science and Technology Dept.- MOIT   | Manager of Energy Efficiency Division   |
| 16                                      | Duong Khac Hien   | Hydropower Department, General Energy Directorate- MOIT                          | Expert  |
| 17                                      | Dinh Vu Thanh     | Science, Technology & Environment Dept.- MARD                                    | Deputy Director   |
| 18                                      | Khong Trung Duan  | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 19                                      | Nguyen Tuan Anh   | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 20                                      | Le Huu Hoang      | Technical-Operational Dept. -EVN   | Expert  |
| 21                                      | Tran Hong Tien    | Technical-Operational Dept. -EVN   | Expert  |
| 22                                      | Le Kim Ngoc       | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| <b>WG Members (Hydropower Group-2)</b>  |                   |  |   |
| 23                                      | Tran Huu Ha       | Science, Technology & Environment Dept.- MOC                                     | Deputy Director   |
| 24                                      | Hoang Quang Nhu   | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 25                                      | Nguyen Cong Thinh | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 26                                      | Dinh Chinh Loi    | Science, Technology & Environment Dept.- MOC                                     | Expert  |
| 27                                      | Doan Trong Tuan   | Vietnam Institute of Architecture, Urban and Rural Planning -                    | Staff   |
| 28                                      | Tran Viet Hoa     | Science and Technology Dept.- MOIT   | Manager of Energy Efficiency Division   |
| 29                                      | Duong Khac Hien   | Hydropower Department, General Energy Directorate- MOIT                          | Expert  |
| 30                                      | Dinh Vu Thanh     | Science, Technology & Environment Dept.- MARD                                    | Deputy Director   |
| 31                                      | Khong Trung Duan  | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 32                                      | Nguyen Tuan Anh   | Science, Technology & Environment Dept.- MARD                                    | Expert  |
| 33                                      | Le Huu Hoang      | Technical-Operational Dept. -EVN   | Expert  |
| 34                                      | Tran Hong Tien    | Technical-Operational Dept. -EVN   | Expert  |
| 35                                      | Le Kim Ngoc       | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| <b>WG Members (Thermal Power Group)</b> |                   |  |   |
| 36                                      | Nguyen Van Long   | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Expert  |
| 37                                      | Tran Hong Tien    | Technical-Operational Dept. -EVN   | Expert  |
| 38                                      | Vu Ta Thong       | Technical-Operational Dept. -EVN   | Expert  |
| <b>WG Members (Network Group)</b>       |                   |  |   |
| 39                                      | Dang Hai Dung     | Science, Technology and Energy Efficiency Dept, General Energy Directorate- MOIT | Deputy Chief of Technical Standards, Metrology, Quality and Intellectual Property Division (until March 2012) |
| 40                                      | Nguyen Duy Hoa    | Science and Technology Dept.- MOIT   | Chief of Technical Standards, Metrology, Quality and Intellectual Property Division                           |
| 41                                      | Cu Huy Quang      | Science and Technology Dept.- MOIT   | Expert / Project Coordinator (until March 2012)   |
| 42                                      | Le Viet Cuong     | Science and Technology Dept.- MOIT   | Expert / Project Coordinator  |
| 43                                      | Cao Van Dung      | Safe Technique and Industry Environment Dept.-MOIT                               | Expert  |
| 44                                      | Trinh Kim Hung    | Expert hired by MOIT   | Retired   |
| 45                                      | Nguyen Sy Be      | Expert hired by MOIT   | Retired   |
| 46                                      | Nguyen Quang Viet | Science, Technology & Environment Dept. -EVN                                     | Deputy Director   |
| 47                                      | Nguyen Xuan Khiem | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| 48                                      | Nguyen Trung Kien | Science, Technology & Environment Dept. -EVN                                     | Expert  |
| 49                                      | Do Lan Binh       | Technical-Operational Dept. -EVN   | Expert  |
| 50                                      | Tran Nam Trung    | Technical-Operational Dept. -EVN   | Expert  |
| 51                                      | Ho Viet Thong     | Hanoi Power Corporation (EVN Hanoi)  | Deputy Director of Technical Dept.  |
| 52                                      | Cao Chan          | VINACONSULT  | Chairman of Management Board (until August 2012)  |
| 53                                      | Tran Vinh Tinh    | Da Nang Technology University  | Head of Power system Faculty  |
| 54                                      | Nguyen Tuan Anh   | Strategy Institute   | Expert of Energy Division   |