

# Appendix

## Appendix—1 Seminar Handouts

- 1.1 1<sup>st</sup> Seminar (February 2, 2009)
- 1.2 2<sup>nd</sup> Seminar (August 5, 2009)
- 1.3 3<sup>rd</sup> Seminar (October 13, 2009)
- 1.4 4<sup>th</sup> Seminar (December 8, 2009)
- 1.5 5<sup>th</sup> Seminar (January 27, 2010)

## Appendix—2 *National Safety Requirements*

## Appendix—3 *Safety Rules* (Japan's sample)

## Appendix—4 Competency Standards for *Engineering Manager*

## Appendix—5 Handbook of New System for Improving Electrical Safety

## Appendix — 1 Seminar Handouts

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## 1.1 1<sup>st</sup> Seminar (February 2, 2009)

**MINISTRY OF ENERGY AND MINERAL RESOURCES  
REPUBLIC OF INDONESIA**

1<sup>st</sup> Seminar on  
"the Study on Development  
of Technical Standards  
and Competency Standards  
in Electrical Power Sector  
in Indonesia"

10 February 2009  
Sari Pan Pacific Hotel, Jakarta

**Japan International Corporation Agency (JICA)  
Tokyo Electric Power Company, Inc. (TEPCO)**

**1<sup>st</sup> Seminar on  
“the Study on Development of Technical Standards  
and Competency Standards in Electrical Power Sector  
in Indonesia”**



**Agenda**

**D a t e : February 10, 2009**

**V e n u e : Sari Pan Pacific Hotel, Istana Ballroom 1**

**Agenda:**

- 8:00 Registration
- 8:30 Opening Address by Mr. Toru Maeda, Minister for Economic Affairs Development, Embassy of Japan
- 8:35 Address by Mr. Takashi Sakamoto, Resident Representative, JICA Indonesia Office
- 8:40 Address by His Excellency Ir. J. Purwano, Director General of Electricity and Energy Utilization Ministry of Energy and Mineral Resources
- 8:50 Presentation on the Outline of the Study by Mr. Masahiko Nagai, Team Leader of the JICA Study Team
- 9:30 Presentation on the Current Situation of Technical & Competency Standards by Mr. Arief Indarto, Head of Sub Directorate for Technical Personnel, MEMR
- 10:00 Q&A
- 10:20 Coffee Break
- 10:40 Presentation “Electrical Power Industry and Electrical Safety in Japan” by JICA Study Team (Mr. Yasushi Iida, Mr. Kenichi Kuwahara, Mr. Toshifumi Karasawa)
- 11:40 Q&A
- 12:20 Closing Address by Mr. Yoshitaka Saito
- 12:30 Welcome Lunch







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**OUTLINE OF  
“THE STUDY ON DEVELOPMENT OF  
TECHNICAL STANDARDS and  
COMPETENCY STANDARDS  
IN ELECTRICAL POWER SECTOR  
IN INDONESIA”**

February 10, 2009

JICA STUDY TEAM


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**Contents**

- Background
- Objectives of the Study
- Scope of the Study
- Concept of the Study
- Schedule of the Study
- Field Studies in Indonesia
- The Study Team

2







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**Background (1/4)**

1. August 2007: Request of Indonesia

- The Government of Indonesia (GOI) officially requested the Government of Japan to extend technical assistance for carrying out the Study on Development of Technical Standards and Competency Standards in Electrical Power Sector in Indonesia (“the Study”)

3




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**Background (2/4)**

2. August 2008: Discussions between JICA and Indonesian authorities concerned

- JICA Preparatory Study Team was dispatched and had a series of discussions with MEMR and concerned authorities of GOI on “the Study”.
- Main points agreed by both parties:
  - The Study is focused on development of technical standards, competency standards and qualification systems for management level personnel in selected fields in electrical power sector.
  - To develop the qualification system for management level, Japanese qualification system will be introduced.
  - After the completion of the Study, MEMR will legislate the standards and systems suggested by the Study with their own initiative.
  - In order to facilitate smooth coordination among relevant organizations, the Steering Committee will be formed for the entire period of the Study

4


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**Background (3/4)**

3. October 2008: Scope of Work for the Study was signed by MEMR and JICA Indonesia Office

- Based on discussions in August 2008, the Scope of the Work for the Study was signed by MEMR and JICA Indonesia Office.
  - Signer
    - MEMR: Ir. J. Purwono,  
Director General of Electricity and Energy Utilization, MEMR
    - JICA: Takahi Sakamoto,  
Chief Representative, Indonesia Office, JICA

5





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**Background (4/4)**

4. February 2009: Commencement of the Study in Indonesia

- JICA dispatched the Study Team on the Study to Indonesia to carry out 1st Field Study from February 1 to 21, 2009.

6

**Objectives of the Study**

To develop

- 1) Technical standards,
- 2) Competency standards, and
- 3) Qualification systems

for management level personnel in selected fields in electrical power sector (generation, transmission and distribution)

7

**Scope of the Study (1/2)**

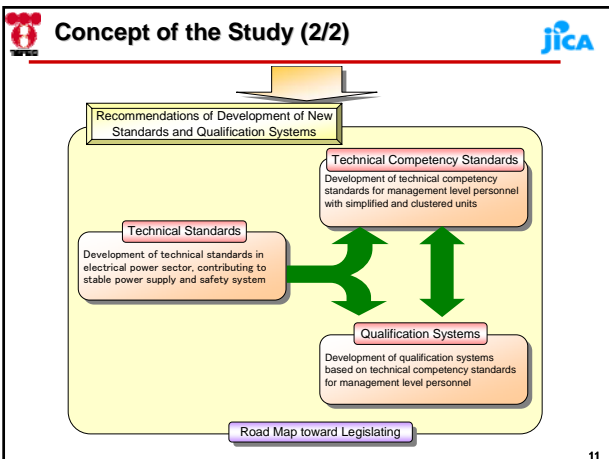
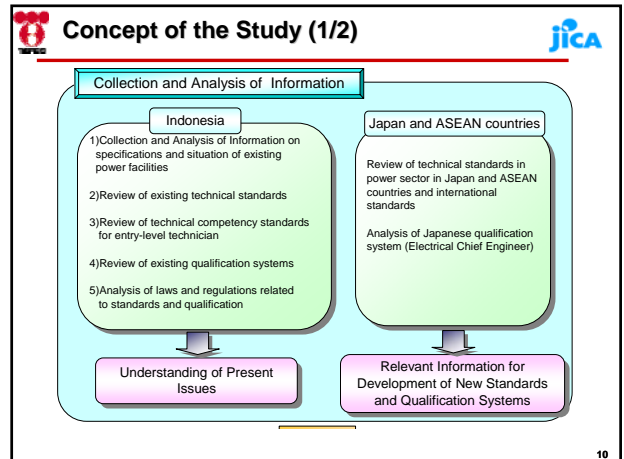
1. Review of existing technical standards and the condition of Indonesia power supply system, current regulations, technical standards and qualification systems.
  - 1) to collect and analyze information on specifications and situation of existing power supply facilities.
  - 2) to evaluate current overall quality of power supply and identify technical problems in power supply systems in terms of technical operation, safety and environment.
  - 3) to collect and analyze information on technical standards, competency standards and qualification systems in Indonesia.
  - 4) to collect and analyze information on existing guidelines for competency standards and qualification systems in Indonesia.

8

**Scope of the Study (2/2)**

2. Development of technical standards
  - 1) to review Japanese cases on technical standards in electrical power sector.
  - 2) to develop technical standards in selected fields (generation, transmission and distribution)
3. Development of competency standards and qualification systems for management level personnel in selected fields in electrical power sector.
  - 1) to review Japanese cases on competency standards and qualification systems in electrical power sector.
  - 2) to develop competency standards for management level personnel in selected fields in electrical power sector.
  - 3) to develop qualification systems for management level personnel in selected fields in electrical power sector.

9



**Schedule of the Study**

Task Type	September 2018	October 2018	November 2018	December 2018	January 2019	February 2019	March 2019	April 2019	May 2019	June 2019	July 2019	August 2019	September 2019	October 2019	November 2019	December 2019
Domestic Work in Japan	1) Collection and Analysis of Information on specifications and situation of existing power facilities	2) Review of existing technical standards	3) Review of technical competency standards for entry-level technician	4) Review of existing qualification systems	5) Analysis of laws and regulations related to standards and qualification	Review of technical standards in power sector in Japan and ASEAN countries and international standards	Analysis of Japanese qualification system (Electrical Chief Engineer)	Understanding of Present Issues	Relevant Information for Development of New Standards and Qualification Systems							
Main Activities	1) Collection and Analysis of Information on specifications and situation of existing power facilities	2) Review of existing technical standards	3) Review of technical competency standards for entry-level technician	4) Review of existing qualification systems	5) Analysis of laws and regulations related to standards and qualification	Review of technical standards in power sector in Japan and ASEAN countries and international standards	Analysis of Japanese qualification system (Electrical Chief Engineer)	Understanding of Present Issues	Relevant Information for Development of New Standards and Qualification Systems							
Sub-activities	1) Collection and Analysis of Information on specifications and situation of existing power facilities	2) Review of existing technical standards	3) Review of technical competency standards for entry-level technician	4) Review of existing qualification systems	5) Analysis of laws and regulations related to standards and qualification	Review of technical standards in power sector in Japan and ASEAN countries and international standards	Analysis of Japanese qualification system (Electrical Chief Engineer)	Understanding of Present Issues	Relevant Information for Development of New Standards and Qualification Systems							

12

**Field Studies in Indonesia (1/2)** 

Total Period: January 2009 – June 2010 (18 months)

- 1st Field Study in Indonesia (early-February to mid-February 2009)
  - Inception report
  - Collection of Information (visiting relevant organizations and existing power facilities)
  - 1<sup>st</sup> Seminar
- 2nd Field Study in Indonesia (mid-May to early-June 2009)
  - Collection of Information (visiting relevant organizations)
  - Study on technical standards
- 3rd Field Study in Indonesia (end-July to mid-August 2009)
  - Progress report
  - 2<sup>nd</sup> Seminar


13

**Field Studies in Indonesia (2/2)** 

- 4th Field Study in Indonesia (early-October to end-October 2009)
  - Interim report
  - 3<sup>rd</sup> Seminar
- 5th Field Study in Indonesia (end-November to early-December 2009)
  - 4<sup>th</sup> Seminar
- 6th Field Study in Indonesia (mid-January to end-January 2010)
  - Draft final report
  - 5<sup>th</sup> Seminar

( Final Report : June 2010)

14

**The Study Team** 

No	Name	Position	Organization
1	Masahiko NAGAI	Team Leader / Technical Standards & Competency Standards	Tokyo Electric Power Company (TEPCO)
2	Yasushi IIDA	Legal System / Management	- ditto -
3	Toshifumi KARASAWA	Qualification System / Capacity Development	- ditto -
4	Toru SUZUKI	Thermal Power Engineering	- ditto -
5	Keisuke KUMIHASHI	Hydro Power Engineering	TEPCO
6	Kenichi KUWAHARA	Transmission Engineering	Shikoku Electric Power Company (YONDEN)
7	Keisuke YANAGIUCHI	Distribution Engineering A	- ditto -
8	Tatsuya ISHII	Distribution Engineering B	- ditto -
9	Manabu MIURA	Distribution Engineering C	- ditto -
10	Keiichi FUJITANI	Substation Engineering	- ditto -
11	Ran AKAIKE	Project Coordination	- ditto -

15

Thank you for your kind cooperation !

The JICA Study Team  
On  
Development of Technical Standards and  
Competency Standards in Electrical Power  
Sector in Indonesia

16



Direktorat Jenderal Listrik dan Pemanfaatan Energi  
Departemen Energi dan Sumber Daya Mineral

**REGULASI KETEKNIKAN**

**DALAM PENGEMBANGAN SDM SEKTOR KETENAGALISTRIKAN**

Oleh :  
**Ir. Arief Indarto, MM.**  
Kasubdit Tenaga Teknik Ketenagalistrikan

Disampaikan Pada Acara  
"Seminar Development of Technical Standards and Competency Standards  
in Electrical Power Sector in Indonesia"

**Direktorat Jenderal Listrik dan Pemanfaatan Energi**  
Departemen Energi dan Sumber Daya Mineral  
Jakarta, 10 Februari 2009



Direktorat Jenderal Listrik dan Pemanfaatan Energi  
Departemen Energi dan Sumber Daya Mineral

**ASPEK PENTING TENAGA LISTRIK**

- (1) Tenaga Listrik mempunyai peran yang sangat penting dan strategis dalam pembangunan ekonomi nasional
- (2) Ketenagalistrikan bersifat padat modal, padat teknologi dan beresiko tinggi
- (3) Tenaga Listrik mempunyai resiko membahayakan bagi manusia dan instalasi ketenagalistrikan, sehingga harus memperhatikan keselamatan ketenagalistrikan

2



Direktorat Jenderal Listrik dan Pemanfaatan Energi  
Departemen Energi dan Sumber Daya Mineral

**DASAR HUKUM**

**UU NO. 15 TAHUN 1985**

**Pasal 15, ayat (1)**  
Pemegang Kuasa Usaha Ketenagalistrikan dan Pemegang Izin Usaha Ketenagalistrikan untuk kepentingan umum wajib:

- a. menyediakan tenaga listrik;
- b. memberikan pelayanan yang sebaik-baiknya kepada masyarakat;
- c. memperhatikan keselamatan kerja dan keselamatan umum.

**Pasal 17**  
Syarat-syarat penyediaan, pengusaha, pemanfaatan, instalasi, dan standardisasi ketenagalistrikan diatur oleh Pemerintah.

4

Direktorat Jenderal Listrik dan Pemanfaatan Energi  
Departemen Energi dan Sumber Daya Mineral

Lanjutan...

**DASAR HUKUM**

**Pasal 18**

- (1) Pemerintah melakukan pembinaan dan pengawasan umum terhadap pekerjaan dan pelaksanaan Usaha Ketenagalistrikan.
- (2) Pembinaan dan pengawasan umum sebagaimana dimaksud dalam ayat (1) terutama meliputi keselamatan kerja, keselamatan umum, pengembangan usaha, dan tercapainya standardisasi dalam bidang ketenagalistrikan.

5

Direktorat Jenderal Listrik dan Pemanfaatan Energi  
Departemen Energi dan Sumber Daya Mineral

**Pokok-Pokok Keselamatan Ketenagalistrikan**

**PP No. 3 Tahun 2005 sebagai perubahan atas PP No. 10 Tahun 1989 tentang Penyediaan dan Pemanfaatan Tenaga Listrik**

1. Setiap kegiatan usaha ketenagalistrikan wajib memenuhi ketentuan mengenai keselamatan ketenagalistrikan.
2. Ketentuan tersebut meliputi standardisasi, pengamanan instalasi tenaga listrik dan pengamanan pemanaaat listrik untuk mewujudkan kondisi andal dan aman bagi instalasi dan kondisi aman dari bahaya bagi manusia serta kondisi akrab lingkungan.
3. Setiap instalasi tenaga listrik yang beroperasi wajib memiliki sertifikat laik operasi.
4. Setiap pemanfaat tenaga listrik yang akan diperjual belikan wajib memiliki tanda keselamatan.
5. Setiap tenaga teknik yang bekerja pada usaha ketenagalistrikan wajib memiliki sertifikat kompetensi.

6





## PEMBINAAN DAN PENGAWASAN STANDARDISASI KOMPETENSI

- ❑ Direktur Jenderal melakukan pengawasan atas penerapan Standar Kompetensi dan pelaksanaan Sertifikasi Kompetensi untuk menjaga tata tertib penyelenggaraan sertifikasi kompetensi yang dilakukan oleh Lembaga Sertifikasi Kompetensi agar tetap memenuhi persyaratan yang ditetapkan
- ❑ Pedoman Pengawasan Sertifikasi Kompetensi.  
(Perdirjen No. 421-12/40/600.3/2007)
- ❑ Pedoman Standardisasi Kompetensi, meliputi :
  - Pedoman Standar Kompetensi  
(Perdirjen No. 420-12/40/600.3/2007)
  - Pedoman Sertifikasi Kompetensi

19

## Terima Kasih



[www.djlpe.esdm.go.id](http://www.djlpe.esdm.go.id)

20

# Electrical Power Industry and Electrical Safety in Japan

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## Contents

- Part 1. Outline of Electric Power Industry
- Part 2. Indices of Electric Power Industry
- Part 3. Safety Regulations by the Electricity Utilities Industry Law



## Part 1:

# Outline of Electric Power Industry

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## 1-1. Japanese Electricity Utilities Industry & Its related Laws

### Electric Power Development

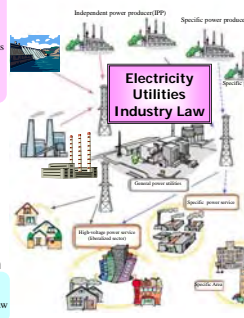
- Electric Power Development Promotion Law
- Law on the Development of Areas Adjacent to Electric Power Generating Facilities
- Electric Power Development Promotion Tax Law
- Electric Power Development Promoting Special Account Law

### Environment

- Basic Environment Law
- Environmental Impact Assessment Law
- Air Pollution Control Law
- Noise Regulation Law
- Vibration Regulation Law
- Water Pollution Control Law
- Law Concerning Special Measures against PCB

### Telecommunication

- Telecommunication Business Law
- Wire Telecommunications Law
- Radio Law



### Atomic Energy

- Atomic Energy Basic Law
- Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors
- Law for Specified Radioactive Waste Final Disposal

### Electrical Safety

- Electricity Utilities Industry Law (Technical Standards)
- Electric Work Specialist Law
- Law Concerning the Business Optimization of Electric Works
- Electrical Appliance and Material Safety Law

### Industrial Safety and Health Law

- Fire Service Law

### Measurement Law

### Japanese Industrial Standardization Law



## 1-2. Objectives of Electricity Utilities Industry Law



### Objectives

### Measures

#### Industry regulations

- Protect profits of electricity users
- Promote sound development of electricity enterprises

Promote proper and rational operation of electric power industry

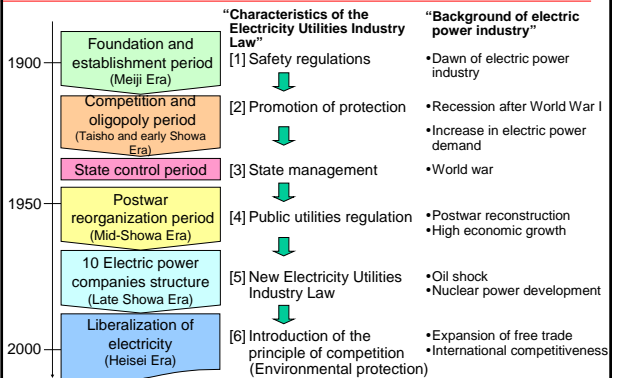
#### Safety regulations

- Ensure public safety
- Promote environmental preservation

Regulate construction, maintenance and operation of electrical facilities



## 1-3. Transition of the Electricity Utilities Industry Law



### 1-4. Ten Electric Power Companies Structure for Consistent Power Generation and Transmission

○ In May 1951, private electric power companies were established in nine regions in Japan, featuring regional monopoly and consistent power generation and transmission.

○ In 1972, Okinawa Electric Power Company was established with the reversion of Okinawa to Japan, then "10 electric power companies structure" was born.

**Vertically Integrated System**

- Power generation
- Power transmission and distribution
- Sales
- Customer

**Regional monopoly**

- Hokkaido Electric Power Co., Inc.
- Tohoku-Electric Power Co., Inc.
- Hokuriku Electric Power Company
- Chugoku Electric Power Co., Inc.
- Tokyo Electric Power Company
- Kyushu Electric Power Co., Inc.
- Chubu Electric Power Co., Inc.
- The Kansai Electric Power Co., Inc.
- Shikoku Electric Power Co., Inc.
- Okinawa Electric Power Company

60Hz / 50Hz

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### 1-5. Enactment of the new Electricity Utilities Industry Law

Taking account of the situation at that time, where the demands were smoothly growing and Utilities' business foundations were developing by a gradual process, the new Electricity Utilities Industry Law has been established in 1964.

○ 1964

#### Electricity Utilities Industry Law (put into effect in December 1964)

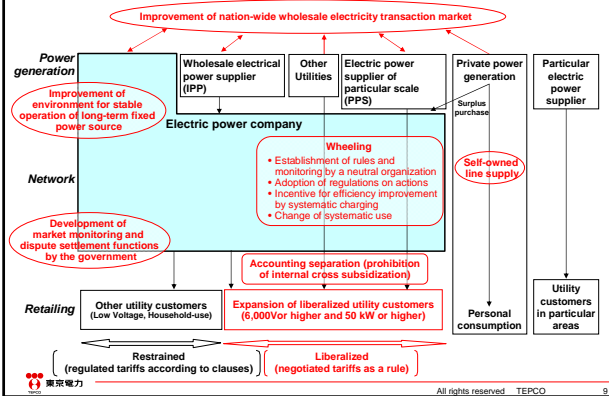
Article 1: This law is intended to protect the profits of electricity users and promote the sound development of electric power industry by promoting proper and rational operation of electric power industry, and to ensure public safety by regulating construction, maintenance and operation of electricity facilities.

Article 28: Electric power suppliers shall cooperate with each other in development of electrical power resources, supply of electricity, operation of electricity facilities and other operations to contribute to comprehensive and rational development of electricity enterprises through broad-based operation.

(Abstract)

- Broad-based operation**  
Reduction of the Business Cost by economical efficiency with Broad-based operation
  - Improvement of utility customer service**  
Obligation of keeping specified voltage and frequency values, in order to protect customers' benefit
  - Autonomous security system**  
Obligation of submitting security rules and appointment of qualified electric engineers, to secure the safety of the electrical facilities
  - Simplification and rationalization of electricity administration**  
Deregulation and Streamlining in Electricity Business
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### 1-6. Electricity Industry System after Liberalization



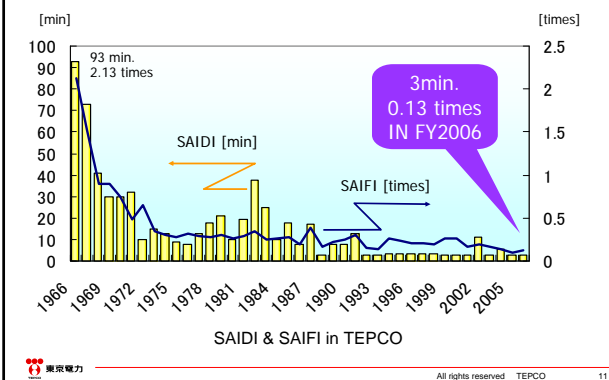
### Part 2:

## Indices of Electric Power Industry

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### 2-1. SAIDI & SAIFI

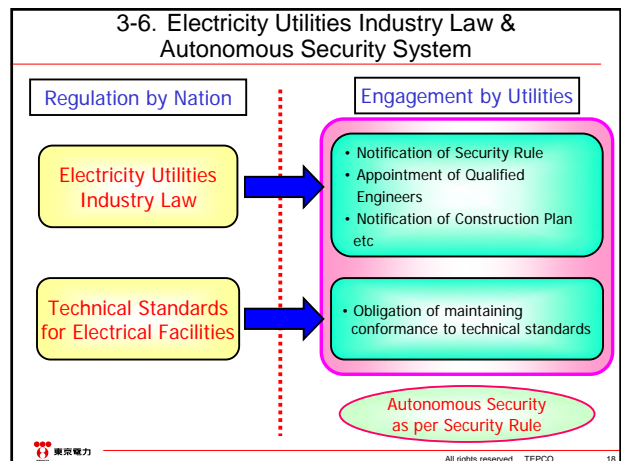
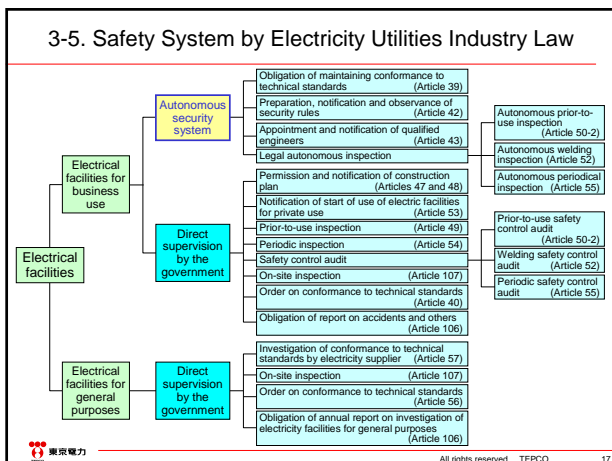
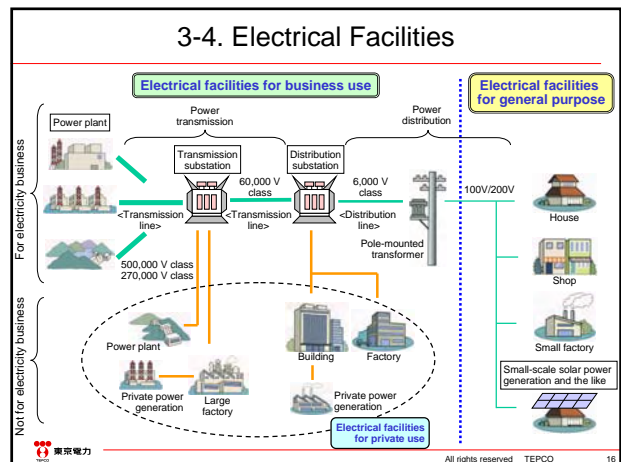
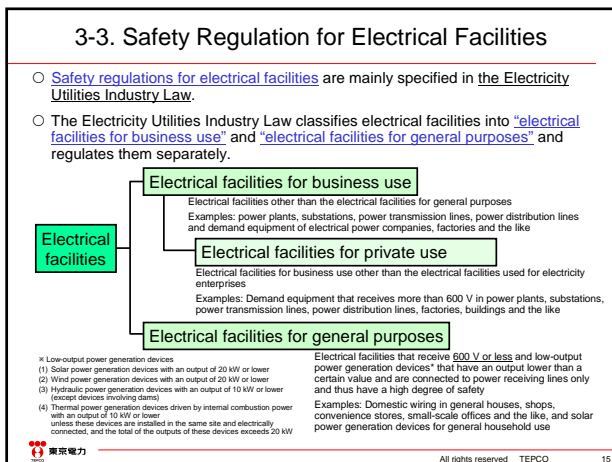
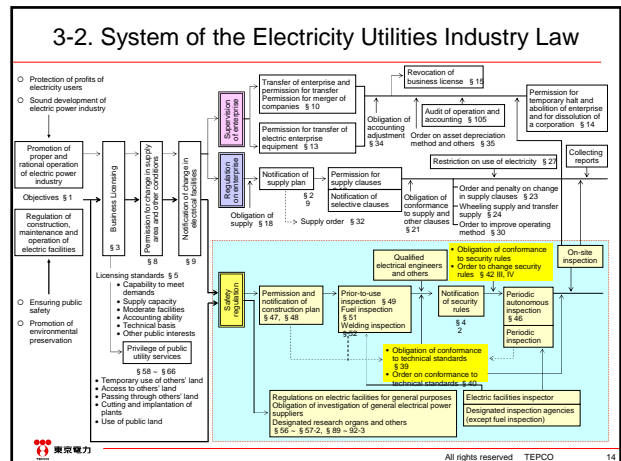
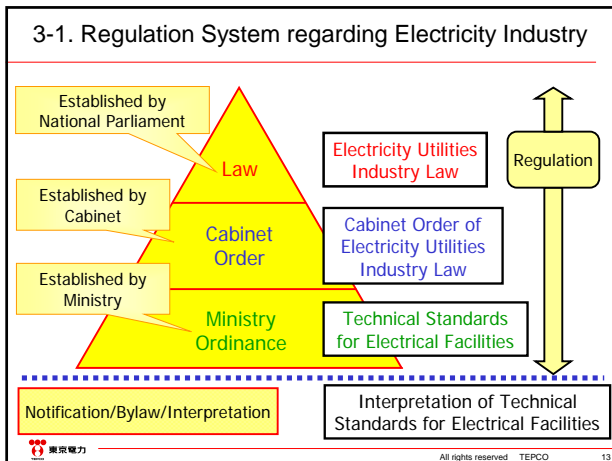


### Part 3:

## Safety Regulations by the Electricity Utilities Industry Law

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### 3-7. Security Regulation on Electrical Facilities

	Electrical facilities for business use (over 600V)	Electrical facilities for general purposes (600V and below)
Preparation, notification and observance of <b>security rules</b>	Yes	No
Appointment and notification of <b>qualified engineers</b>	Yes	No
Notification of construction plan	Yes (partly)	No
Autonomous prior-to-use inspection	Yes (partly)	No
Autonomous Welding inspection	Yes (partly)	No
Autonomous Periodical inspection	Yes (partly)	No
<b>Obligation of maintaining conformance to technical standards</b>	Yes	No
Order on conformance to technical standards	Yes	Yes
Investigation of conformance to technical standards by electricity supplier	No	Yes

### 3-8-(1). Maintenance of Electrical Facilities for Business Use

#### (Article 39) Maintenance of Electrical Facilities for Business Use

- Those who install electrical facilities for business use shall **keep the facilities conforming to technical standards** specified by the Ministry of Economy, Trade and Industry.



### 3-8-(2). Maintenance of Electrical Facilities for Business Use

The purposes of this Article are "Electrical Facilities ...

- Shall do no harm to human body
- Shall not cause damage to property
- Shall not cause **electrical or magnetic interference**
  - Inductive interference, radio interference, electrical corrosion interference, magnetic observation interference and others
- Shall not cause **significant interference with electricity supply from general electrical power suppliers**
  - The general electrical power suppliers are those who are licensed to do electricity supply operations to meet general demands. (10 electrical power companies)



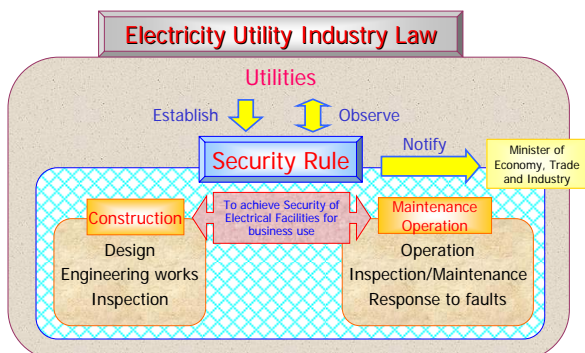
### 3-9-(1). Security Rules

#### (Article 42) Notification of Security Rules

- Those who install electrical facilities for business use shall **establish security rules** and **notify the Minister of Economy, Trade and Industry** of the rules.

Article 42 of the Law,  
Article 42-2 to -4 of the Law and  
Article 50 of the Enforcement Regulation

### 3-9-(2). Outline of Security Rules



### 3-9-(3). An example of Security Rules

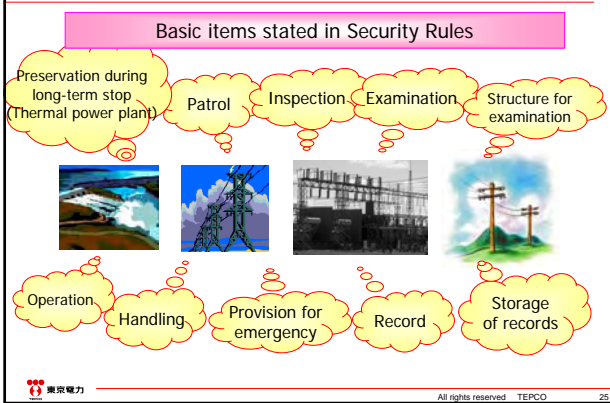
An example of TEPCO Security Rules



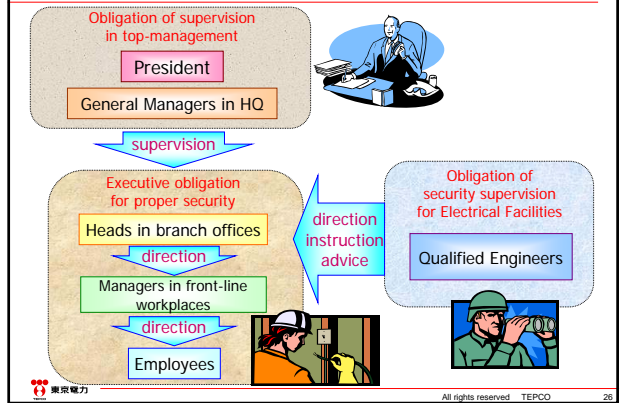
- TEPCO has two types of **Security Rules** as per Law:
  - Electrical facilities for electrical enterprises
  - Electrical facilities for private use
- In-house Manuals** regarding Security Rules:
  - Office organization and job function rules (Z-10)
  - Operation rules for Security Rules (Z-25)
  - Basic operation manual for Security Rules (AM-7)
  - Basic manual for qualified electrical engineers (AM-4)



### 3-10. Outline of Security Works



### 3-11. TEPCO's structure for Security Management



### 3-12. Qualified Engineers

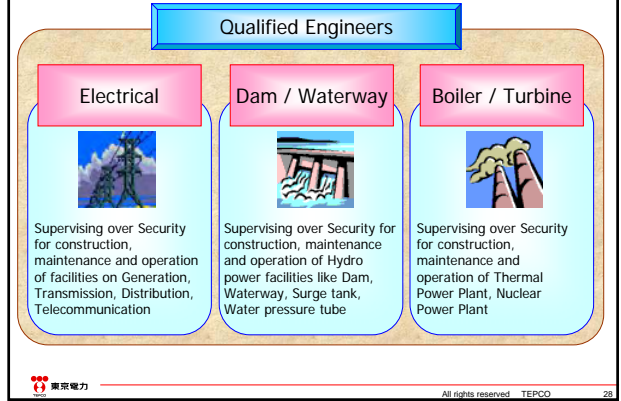
#### (Article 43) Appointment of Qualified Engineers

- **Qualified Engineers** shall be appointed to supervise security for construction, maintenance and operation of electrical facilities for business use.

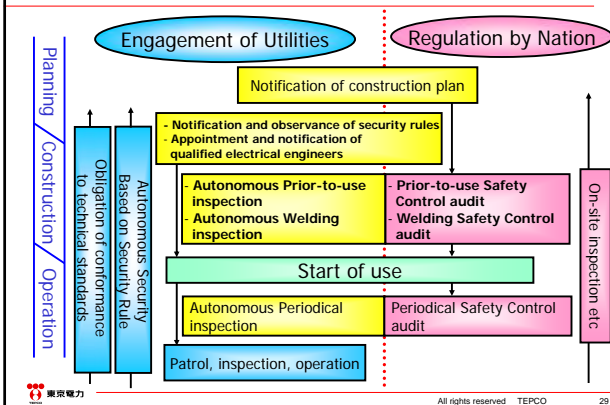


Article 43 of the Law,  
Article 44 of the Law and  
Article 52 of the Enforcement Regulation

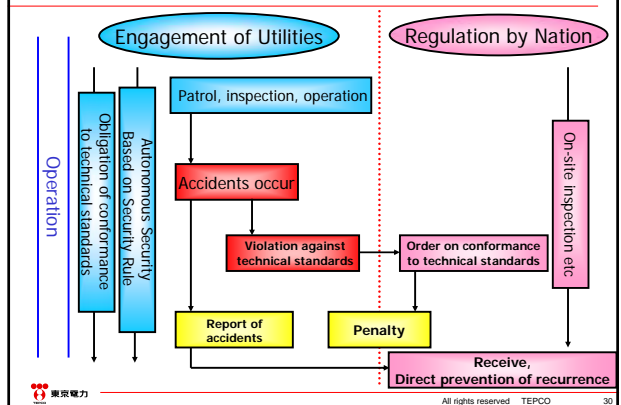
### 2-13. Types of Qualified Electrical Engineers



### 3-14-(1). Autonomous Security & Safety Regulation

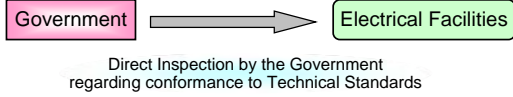


### 3-14-(2). Autonomous Security & Safety Regulation

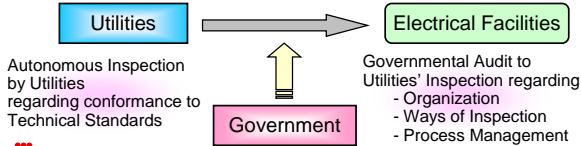


### 3-15. Concept of Safety Control Audit System

Before adoption (until 2000)



After adoption (since 2000)



### 3-16. Application of Safety Control Audit System per Electrical Facilities

Electrical Facilities	Prior- to-use inspection	Welding inspection	Periodical inspection
Steam power generation	○	○	○
Gas turbine generation	○	○	○
Internal-combustion power Generation	○		
Hydro power generation	○		
Fuel cell	○	○	○
Wind power generation	○		
Solar power generation	○		
Transmission	○		
Distribution			

### 3-17. Prior-to-use Safety Control Audit

#### System of prior-to-use inspection

- **Legal** ... Inspections as per the Electricity Enterprises Law
    - Distribution: 275 kV or more
    - Thermal power: except internal combustion power stations
    - Hydraulic power: output of 30,000 kW or higher and dam height of 15 m or higher
  - **Non-designated by law** ... In-house inspections
    - Inspections by qualified engineers
    - Inspections by the departments which manage facilities
- Article 52 of the Law, Article 52-3 of the Law, Article 80 of the Enforcement Regulation and Article 82-2 of the Enforcement Regulation

### 3-18. Welding Safety Control Audit

#### (Article 52) Autonomous Welding Inspection

- Those who install **boilers and turbines** involving welding of **containers with a pressure of 98 kPa or higher** and **pipes with a pressure of 980 kPa or higher with outer diameter of 150 mm or larger** in thermal power stations and other facilities shall conduct the electrical power supplier's inspection before starting the use of the equipment, and shall keep a record of inspection results.

#### (Article 52-3) Welding Audit

- **Audits** done by the accredited organization about the **system of autonomous inspection** such as **organization, ways of inspection, process managements** etc.
- Article 52 of the Law, Article 52-3 of the Law, Article 80 of the Enforcement Regulation and Article 82-2 of the Enforcement Regulation

### 3-19. Periodical Safety Control Audit

#### (Article 55) Autonomous Periodical Inspection

- Those who install particular electricity facilities (**boilers and turbines for power generation**) shall **periodically conduct the electrical power supplier's inspection** on the electrical facilities, and shall **keep a record of inspection results**.

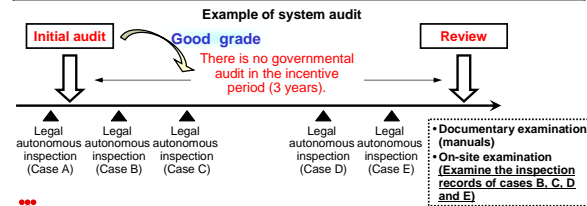
#### (Article 55-4) Periodical Audit

- **Audits** done by the minister of Economy, Trade and Industry about the **system of autonomous inspection** such as **organization, ways of inspection, process managements** etc.

Article 55 of the Law, Article 55-3 of the Law and Article 94-4 of the Enforcement Regulation

### 3-20. Incentive in Safety Control Audit System

Item	Before revision	After revision (since July 2000)
Construction plan	Permission of the government	Permission of the government Partly, Notification to the government
Inspection	<ul style="list-style-type: none"> <li>• Prior-to-use inspection</li> <li>• Welding inspection</li> <li>• Periodic inspection by the government</li> </ul>	<ul style="list-style-type: none"> <li>○ The government's inspection is abolished, and <b>legal autonomous inspection</b> is adopted.</li> <li>○ The government executes <b>safety control audits</b>.</li> <li>• The government audits and evaluates the state of execution of legal autonomous inspection                             <ul style="list-style-type: none"> <li>• A 3-year incentive is given to a company which is evaluated as "conforming" as a result of the system safety control audit (There is no government intervention in this period.)</li> </ul> </li> </ul>



### 3-21. On-site Inspection

#### (Article 107) On-site Inspection

- Besides Safety Control Audit System, Government still has the **strong authority** to inspect Electric Power Facilities, **whenever they request** to do.

#### Actual examples of On-site Inspection

- Distribution facilities: 4 regional offices /year
- Transmission facilities (including telecommunication equipment): 1 office or station (all equipment)/year
- Hydroelectric power facilities: every 10 years/power station

Article 107 of the Law



Terima kasih

### Reference



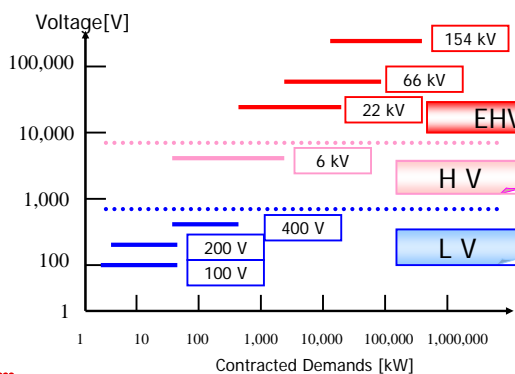
### Types of Voltage

(Article 2 in Technical Standards for Electrical Facilities)

Types of Voltage	Voltage	TEPCO's nominal voltages
1. Low Voltage	DC: 750 V & below AC: 600 V & above	100 V, 200 V 400 V
2. High Voltage	DC: above 750 V, 7000 V and below AC: above 600 V, 7000 V and below	6.6 kV
3. Extra High Voltage	above 7000 V	22 kV, 66 kV, 154 kV, 275 kV, 500 kV

\* AC is smaller than DC because effective values are indicated [Article 2 of Technical Standards]

### Nominal Voltages & Contracted Demands in Japan



### Current Situations of Safety Regulation for Electrical Facilities

#### <Electrical facilities for business use (except those for nuclear power)>

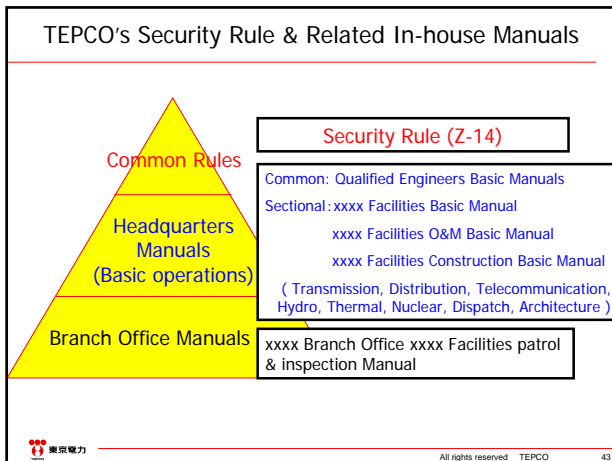
- Installers are obliged to **ensure the autonomous security system**.  
For example, preparation and observance of security rules, appointment of licensed engineers, observance of **technical standards**, and autonomous inspection
- The government performs prior checks and takes measures afterwards as needed.  
For example, ordering in conformance to **technical standards**, construction plan, collecting reports, and on-site inspection

#### <Electrical facilities for general purposes>

- Owners or occupants are responsible for safety.
- Electrical power suppliers** are obliged to **conduct investigations**.
- The government takes measures afterwards as needed.  
For example, order on conformance to **technical standards** and on-site inspection

Installers of electrical facilities for business use (except those for nuclear power) are assumed to have sufficient knowledge of electrical safety, and are obliged to secure the autonomous security system by appointment of qualified electrical engineers, preparation and observance of security rules, observance of technical standards, autonomous inspections and other means.

Electrical facilities for general purposes require a different security system from electrical facilities for business purposes. This is because electrical facilities for general purposes are mainly installed in general houses, and generally owned or occupied by those who have little expertise about electrical safety. The responsibility for safety of electrical facilities for general purposes lies with their owners or occupants, while the **electrical power suppliers are obliged to conduct investigations** to ensure electrical safety in general houses and others.



### Prior-to-use Safety Control Audit

(Article 50-2) Autonomous Prior-to-use inspection

- Those who install electric facilities for business use shall conduct an [autonomous inspection](#) on the newly-constructed electric facilities, [before starting the use](#) of them, and shall keep a record of inspection results.

(Article 50-2-3) Prior-to-use Audit

- Those who install electric facilities for business use shall [undergo audits](#) done by the minister of Economy, Trade and Industry about the system of [autonomous inspection](#) such as [organization](#), [ways of inspection](#), [process managements](#) etc. [Article 50-2-3 of the Law](#), [Article 73-3 of the Enforcement Regulation](#), [Article 73-5 of the Enforcement Regulation](#) and [Article 73-6 of the Enforcement Regulation](#)

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## 1.2 2<sup>nd</sup> Seminar (August 5, 2009)

**MINISTRY OF ENERGY AND MINERAL RESOURCES  
REPUBLIC OF INDONESIA**

2<sup>nd</sup> Seminar on  
"the Study on Development  
of Technical Standards  
and Competency Standards  
in Electrical Power Sector  
in Indonesia"

05 August 2009  
Hotel Bumi Karsa Bidakara Jakarta

**Japan International Cooperation Agency (JICA)  
Tokyo Electric Power Company, Inc. (TEPCO)**

**SUSUNAN ACARA SEMINAR KE - 2**  
**“DEVELOPMENT OF TECHNICAL STANDARDS AND**  
**COMPETENCY STANDARDS**  
**IN ELECTRICAL POWER SECTOR IN INDONESIA”**

Rabu, 5 Agustus 2009

Waktu	Acara	Pelaksana
09.00 – 09.30	Pendaftaran peserta	Panitia
09.30 – 09.50	Pembukaan : a. Sambutan dari Kedutaan Besar Jepang b. Sambutan dan Pembukaan oleh Direktur Jenderal Listrik dan Pemanfaatan Energi	Mr. Takehiro TSUCHIYA <i>(Secretary Embassy of Japan)</i>  Ir. Johnni R.H. Simanjuntak Direktur Teknik dan Lingkungan Ketenagalistrikan, DESDM
09.50 – 10.00	Rehat	Panitia
10.00 – 11.00	Presentasi : <i>i. Progress of the Study</i> <i>ii. Expected Output of the Study</i> <i>iii. National Safety Requirements</i> <i>iv. Engineering Manager System</i>	JICA Study Team
11.10 – 11:50	Diskusi	Moderator : Ir. Arief Indarto, MM. Ditjen Listrik dan Pemanfaatan Energi, DESDM
11.50 – 12.00	Penutupan	Mr. Yoshitaka SAITO <i>JICA Expert on Electric Power an Energy Policy</i>
12.00 –	Makan Siang	Panitia



## The Study on Development of Technical Standards and Competency Standards in Electrical Power Sector in Indonesia


- Presentation for the 2<sup>nd</sup> Seminar -

5<sup>th</sup> August 2009  
JICA Study Team


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1


## Table of Contents




- I. Progress of the Study
- II. Expected Output of the Study
- III. *National Safety Requirements*
- IV. *Engineering Manager System*

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2




## I. Progress of the Study

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3


## Objectives of the Study



To develop:


- 1) Technical standards;  
[*National Safety Requirements*]
- 2) *Engineering Manager* system  
and their Technical Competency;
- 3) Qualification systems  
for *Engineering Manager*;

in electrical power sector  
(generation, transmission and distribution)


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4

## 3<sup>rd</sup> Field Study with Overall Workflow



	Japanese FY 2008			Japanese FY 2009												Japanese FY 2010										
	12	1	2	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6					
Major Works	Information & Data Collection & Analysis	[Progress bar from Feb 2009 to Feb 2009]																								
	Technical Standard																									
	Technical Competency																									
	Electric Power Qualification System																									
Field Study	1st																									
	2nd																									
	3rd																									
	4th																									
	5th																									
	6th																									

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5

## Field Studies in Indonesia (Achievement)



1. 1st Field Study in Indonesia (early-February to mid-February 2009)
  - Inception report
  - Collection of Information
  - 1<sup>st</sup> Seminar (on February 10, 2009)
2. 2nd Field Study in Indonesia (early-June 2009)
  - Collection of Information (visiting relevant organizations)
  - Study on technical standards
3. 3rd Field Study in Indonesia (end-July to mid-August 2009)
  - Progress report (including Preliminary Draft of "*National Safety Requirements*")
  - 2<sup>nd</sup> Seminar

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6



## Field Studies in Indonesia (Plan)

4. 4th Field Study in Indonesia (early-October to end-October 2009)
  - Interim report (Including preliminary draft of "Engineering Manager System")
  - 3<sup>rd</sup> Seminar
5. 5th Field Study in Indonesia (end-November to early-December 2009)
  - 4<sup>th</sup> Seminar
6. 6th Field Study in Indonesia (mid-January to end-January 2010)
  - Draft final report
  - 5<sup>th</sup> Seminar

( Final Report : June 2010)

7

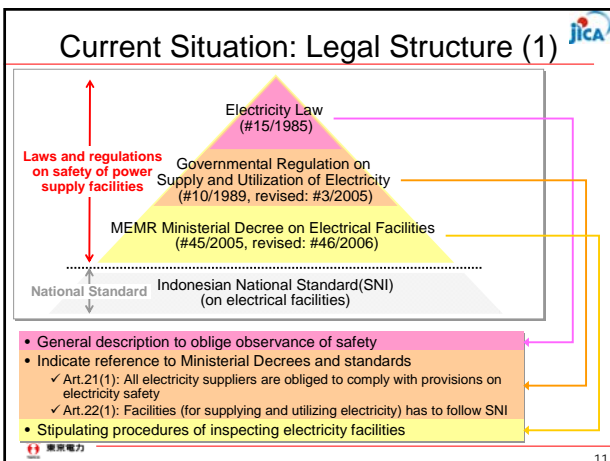
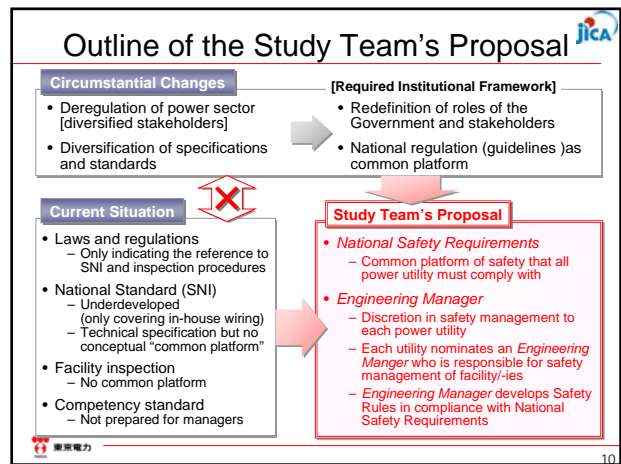
## The Study Team

No	Name	Position	Organization
1	Masahiko NAGAI	Team Leader / Technical Standards & Competency Standards	Tokyo Electric Power Company (TEPCO)
2	Yasushi IIDA	Legal System / Management	- ditto -
3	Toshifumi KARASAWA	Qualification System / Capacity Development	- ditto -
4	Toru SUZUKI	Thermal Power Engineering	- ditto -
5	Chiayuki JOZAKI	Hydro Power Engineering	TEPCO
6	Kenichi KUWAHARA	Transmission Engineering	YONDEN
7	Keisuke YANAGIUCHI	Distribution Engineering A	TEPCO
8	Tatsuya ISHII	Distribution Engineering B	- ditto -
9	Manabu MIURA	Distribution Engineering C	- ditto -
10	Keiichi FUJITANI	Substation Engineering	- ditto -
11	Ran AKAIKE	Project Coordination	- ditto -

8

## II. Expected Output of the Study

9



## Current Situation: Legal Structure (2)

**Observations**

- No clear relations between Governmental Regulation and Ministerial Decree in terms of how safety in facility installation is secured
- Insufficient description of conceptual layout on safety (unclear definition of "safety" in laws and regulations)
- Insufficient definition of what should be provided in SNI (how SNI should be regulated for securing safety)

**The Government needs to present fundamental concept on "how safety in power supply can be secured" as the precondition of technical specifications and procedures**

12

### The Study Team's Proposal 1: National Safety Requirements

- The Study Team proposes to strengthen **National Safety Requirements** in the existing legal system to serve for securing safety in facility installation/operation/maintenance

**Strengthening National Safety Requirements in the existing legal system**

which shall comprise:

- Technical requirements to meet the safety concept
- Implementation criteria for government's assessment

Electricity Law (#15/1985)

Governmental Regulation (#10/1989, revised: #3/2005)

MEMR Ministerial Decree (#45/2005, revised: #46/2006)

Safety Requirements

Indonesian National Standard (SNI) (on electrical facilities)

13

### Roles of National Safety Requirements

- National Safety Requirements**, with which any stakeholder in the sector must comply for safety in power supply, needs to be developed as the "common platform" that any power utility needs to conform to regardless of standards

Common platform to provide superordinate concept of technical specifications / standards

National Safety Requirements for power supply

Legal System Improvement  
Business Quality Improvement  
Safety Level Improvement

Compliance with the "Common platform"

SPLN  
PLN's in-house standard

SNI  
National Standard

IEC  
Other Standards used in Indonesia

IEEE

JIS

14

### Outline of National Safety Requirements

**Overall Structure of National Safety Requirements**

Safety Principles for electric power facilities

Requirements for installation of electric network system

Requirements for common generating facilities

Requirements for hydro power generation

Requirements for thermal power generation

15

### Current Situation: Sector Structure

**Deregulation of Power Sector in Indonesia**

- Transition from old system to current "Diversified structure" with various stakeholders in the sector
- For promoting efficiency, the main objective of deregulation, roles should be clearly separated between the Government and power utilities (stakeholders) so that safety of electricity facilities should be maintained on the responsibility of each stakeholder

**Transition of Power Sector Structure (example: Java-Bali Area)**

Old system

Current (diversified structure)

Generation

Transmission

Distribution

IP, PJB, IPPs

P3B-JB

Distribution Offices (PT PLN)

Safety on each stakeholder's responsibility

16

### The Study Team's Proposal 2: Engineering Manager System

- Considering circumstantial backgrounds of the power sector with diversified players, **the responsibility for safety management** of each assigned electricity facility should be clarified.
- The Study Team proposed **Engineering Manager system** based on Japan's Chief Electrical Engineer system.
- One of the main roles of **Engineering Manager** is doing jobs according to the **National Safety Requirements**.

Current System

New System

Government

PLN

IPPs

Only obliging "compliance with safety" in general (no indication specifically who's responsible)

Licensing of Engineering Manager

Discretion and responsibility in safe management of facilities

17

### Competency Standard for Engineering Manager

- The Government (via Qualification Bodies) provides license to **Engineering Manager**, based on the Competency Standard that is developed for confirming:
  - Their understanding of **National Safety Requirements**, the common platform of technical requirements (to be specified in the next slide);
  - Their ability of developing **Safety Rules** for their own facilities, which must conform to **National Safety Requirements**
- Power utilities that fail to nominate a "licensed" **Engineering Manager** are penalized.
- The nominated **Engineering Manager** whose activities fail to comply with **National Safety Requirements** is also penalized

Government

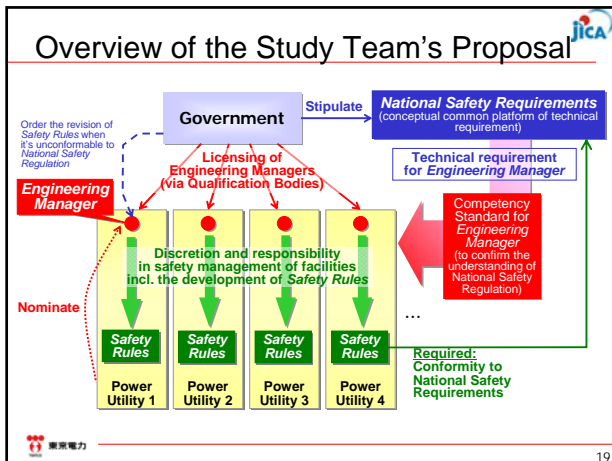
National Safety Requirements (conceptual common platform of technical requirement)

Technical requirements for Engineering Managers

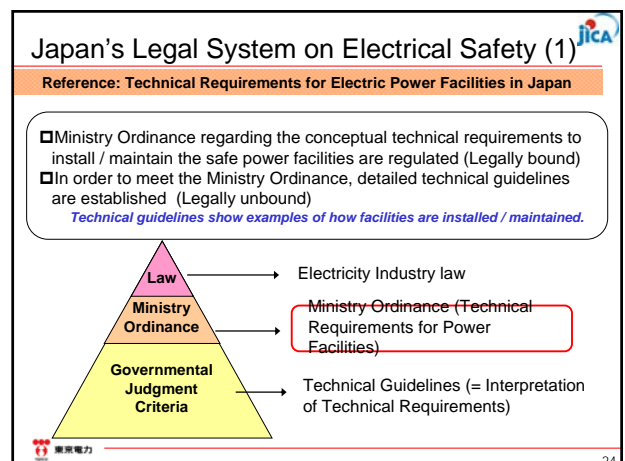
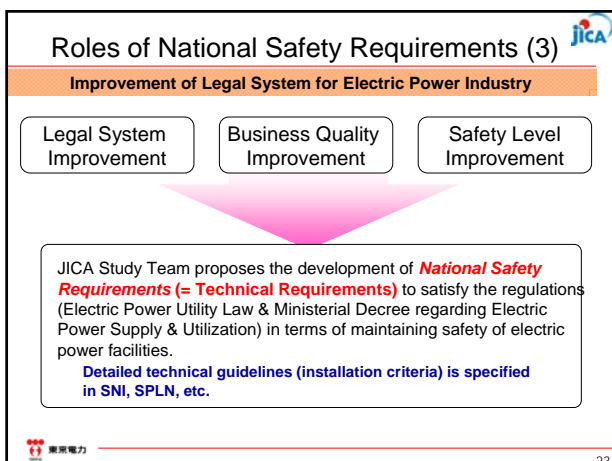
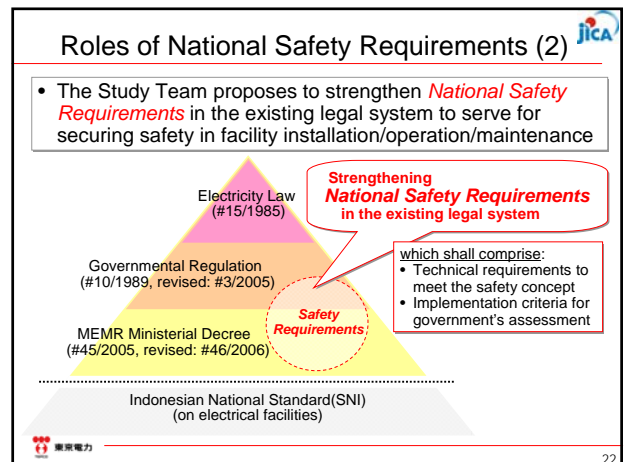
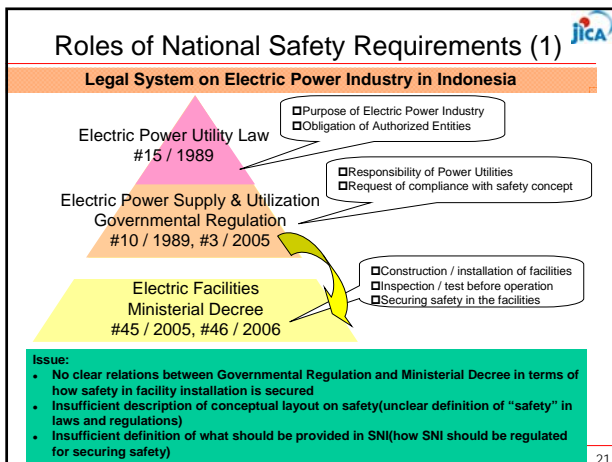
"Licensed Engineering Managers" obligation to comply with National Safety Requirements

Competency Standard for licensing Engineering Manager

18



### III. National Safety Requirements



## Japan's Legal System on Electrical Safety (2)

Reference: Technical Requirements for Electric Power Facilities in Japan

<b>Electricity Industry Law</b> <ul style="list-style-type: none"> <li>Prevention of physical damage</li> <li>Prevention of damage to objects</li> <li>Prevention of electric/magnetic interference</li> <li>Prevention of power supply hindrance</li> </ul>	<b>Ministry Ordinance (Technical Requirements for Power Facilities)</b> <ul style="list-style-type: none"> <li><b>Prevention of electric shock/fire</b> <ul style="list-style-type: none"> <li>Prevent electric shock/fire from power lines</li> <li>Prevent electric shock by OH/UG conductor</li> <li>Prevent wire breakage</li> <li>Grounding of electric facilities</li> <li>Prevent unauthorized entry to substations</li> <li>Height of overhead power line</li> </ul> </li> <li><b>Prevent dangers to other wires, objects</b> <ul style="list-style-type: none"> <li>Prevent interference between conductors</li> <li>Prevent dangers to other objects by power line</li> </ul> </li> </ul>	<b>Judgment Criteria</b> <ul style="list-style-type: none"> <li>Interpretation of Technical Requirement</li> </ul>
--	---	--

General stipulations in Electricity Industry Law regarding facility installation / maintenance are further specified in Ministry Ordinance, which describes technical requirements conceptually as the basis for installing / maintaining electric facilities. Judgment criteria is also provided as its implementation guidelines

## Japan's Legal System on Electrical Safety (3)

In Japan, law, regulation, order, etc are linked logically

↓

- Administrative Agency**
  - Agency can judge without difficulty whether Electric Power Utilities comply with law, regulation, etc.
  - ➡ Security of quality and safety level in the power business
- Electric Power Utilities, New Entrants**
  - Utilities comply with law, regulation, etc. as far as they install power facilities based on the judgment criteria (technical guidelines)
  - ➡ Promotion of Understanding by the new entrants how the facilities are installed

## Outline of National Safety Requirements for Indonesia

**Safety principle for electric power facilities**

- Prevention of Electric Shock or Fire at Electric Facilities
- Prevention of abnormal condition
- Prevention of electrostatic or electromagnetic induction
- Prevention of failure of power supply

↓

- Requirements for installation of electric network system**  
Insulation, Minimum clearance, Prevention of collapse of electric pole etc.
- Requirements for common generating facilities**  
Installation of Hydrogen-cooled Generators, Mechanical strength of Generators etc.
- Requirements for hydro power generation**  
Strength, Materials, Stability and Construction of Levee Body etc.
- Requirements for thermal power generation**  
Structure of Steam turbines, Gas turbines, Internal combustion engines etc.

## Responsibilities Covered by National Safety Requirements (1)

- Transmission and Distribution networks which supply power to customers are regulated by National Safety Requirements.
- In-house low voltage wiring as well as self-use of high voltage facilities are NOT regulated by National Safety Requirements. And the most of these facilities have already covered by SNI and S-PLN.

**Scope of National Safety Requirements**

## Responsibilities Covered by National Safety Requirements (2)

**General layout of Hydropower plant**

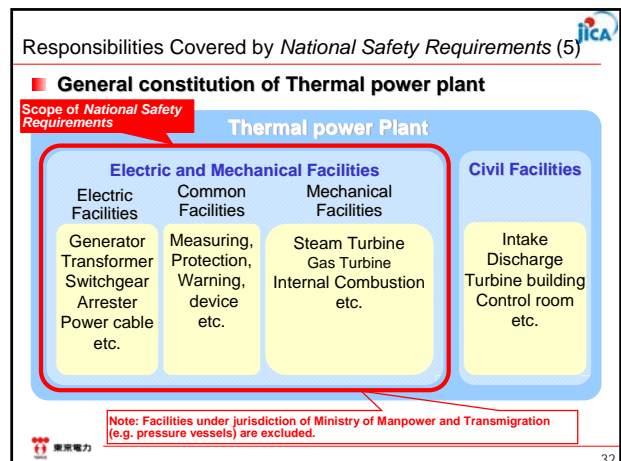
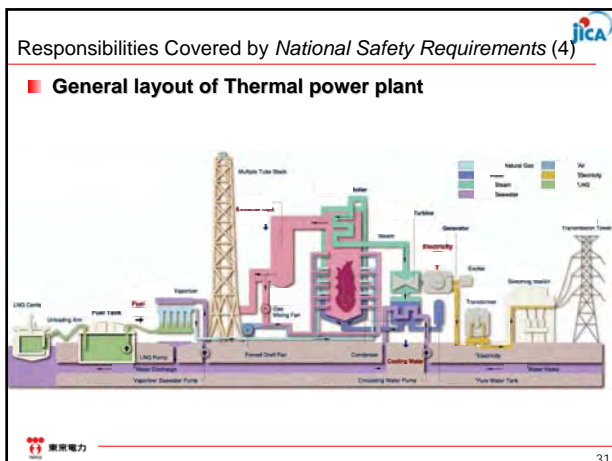
## Responsibilities Covered by National Safety Requirements (3)

**General constitution of Hydropower plant**

**Scope of National Safety Requirements**

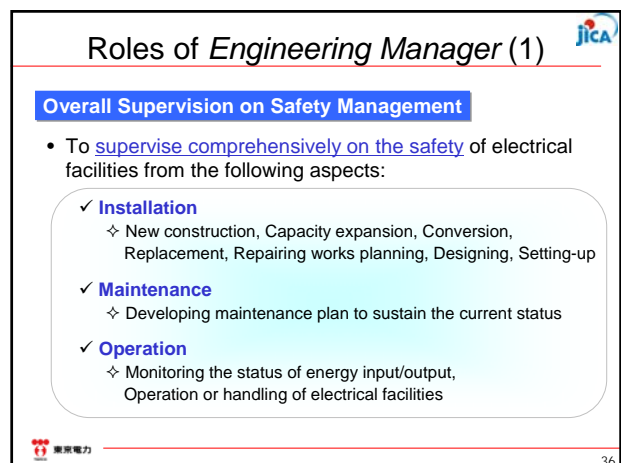
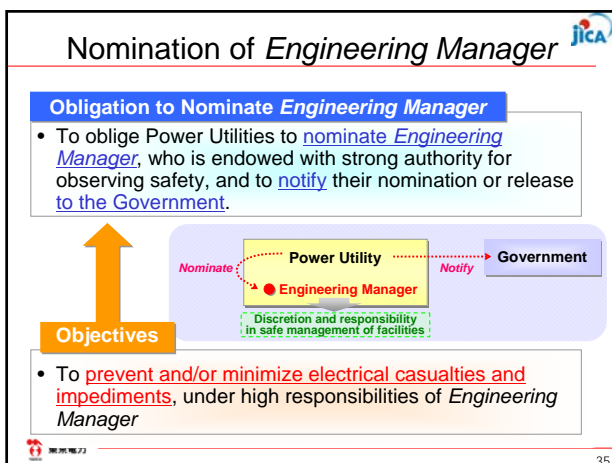
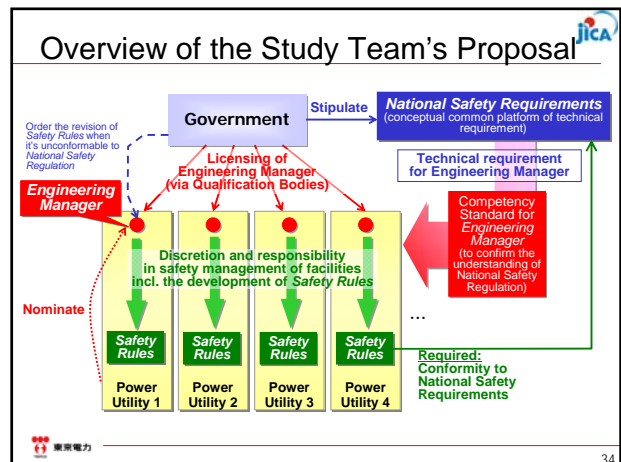
Electric and Mechanical Facilities			Civil Facilities
Electric Facilities	Common Facilities	Mechanical Facilities	
Generator Transformer Switchgear Arrester Power cable etc.	Measuring device Protection device Monitoring & operating device Warning device Emergency power source	Turbine Pump-turbine Inlet valve	Dam Intake Settle basin Headrace Surge tank Penstock Tailrace Reservoir

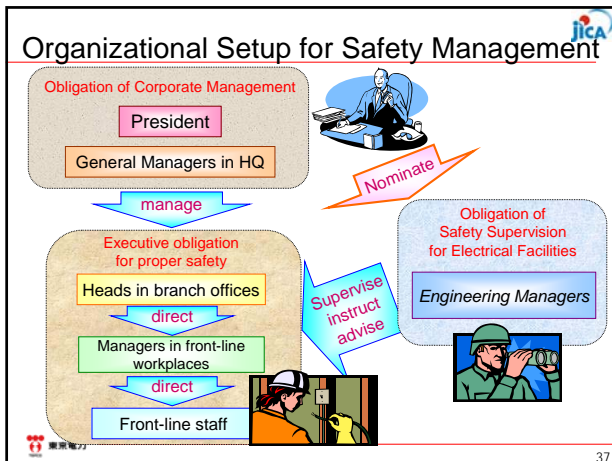
Note: Facilities under jurisdiction of PU (e.g. large-size dams) are excluded.



## IV. Engineering Manager System

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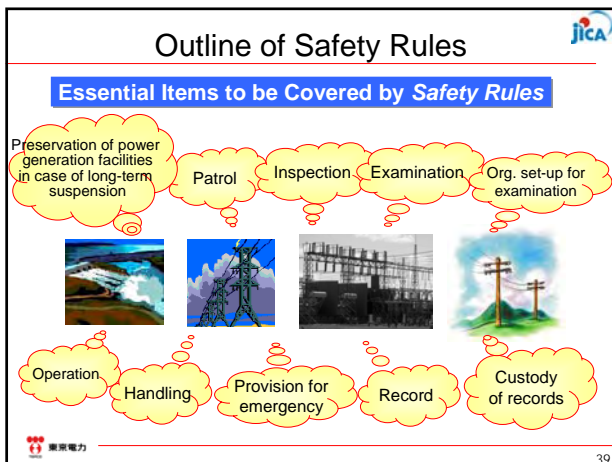
### Roles of Engineering Manager (2)

#### Development of Safety Rules

- Engineering Managers are entitled/obliged to develop Safety Rules under their responsibilities, which covers items essential for safety management as per their actual condition.

- Duty assignment and organization of Operational Managers
- Education to employees about Safety
- Patrol, check and inspection regarding Safety
- Operation and manipulation of Electrical Facilities
- Way of conservation for Power Plants in the case of long-term stop
- Provision in the case of casualty or other kind of emergencies
- Records in regards to Safety
- Necessary items other than abovementioned ones for Safety

Page 38



### Roles of Engineering Manager (3)

#### Notification of Safety Rules to Government

- Engineering Managers are obliged to notify the Government of Safety Rules, before starting to use Electrical Facilities, or whenever the amendment of Safety Rules is made.

#### Government's Order to Amend Safety Rules

- The Government can order Engineering Manager to amend Safety Rules, when Safety Rules are found inappropriate in terms of:
  - Conformity with National Safety Requirements
  - Compatibility with new technologies (e.g. advanced electrical facilities, maintenance automation)

Page 40

### Roles of Engineering Manager (4)

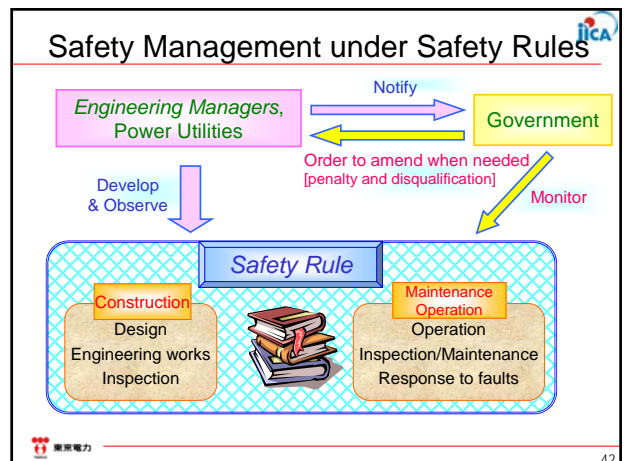
#### Obligation to Observe Safety Rules

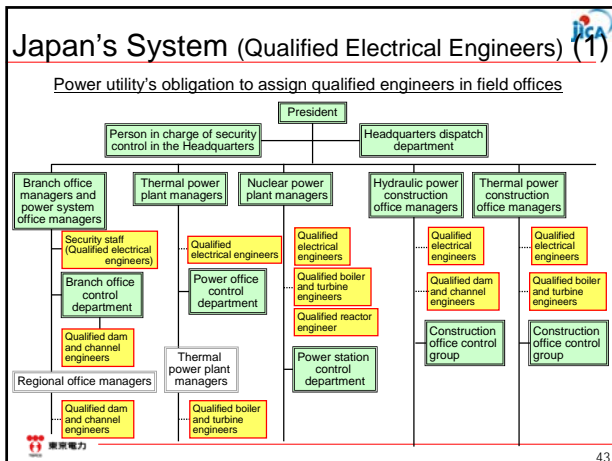
- Engineering Managers, Utilities and their employees are obliged to observe Safety Rules.

#### Penalty, Disqualification

- Power Utilities are subject to penalty in the case violation / deviation from Safety Rules is found.
- Engineering Managers are also subject to disqualification of licenses, unless they do not observe Safety Rules.

Page 41



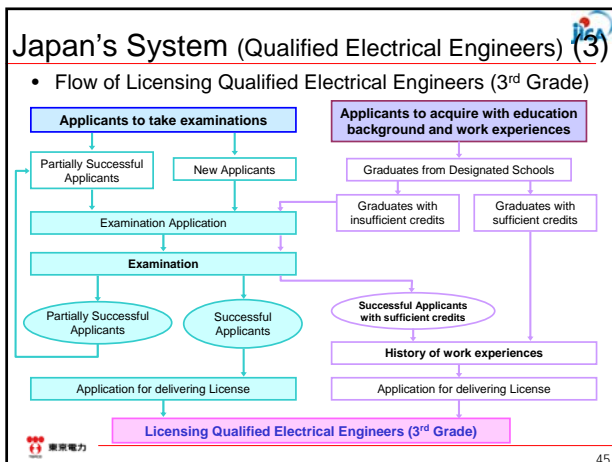


### Japan's System (Qualified Electrical Engineers) (2)

#### Appointment of "Qualified Electrical Engineers" in Japan

- "Qualified Electrical Engineers" shall be appointed to supervise safety for construction, maintenance and operation of Electrical Facilities for business use as per "Electricity Industry Law".
- Qualified Electrical Engineers consists of 3 Grades that differ in the coverage of responsibilities, which is classified by the voltage they are allowed to deal with.

44



### Key Issues to be considered

- This JICA Study Team's proposal assumes that *Engineering Managers* are those endowed with exclusive responsibility for supervising on the safety of Electrical Facilities.
- In other words, *Engineering Managers* are *not necessarily identical with General Managers in a corporate entity* who are responsible for corporate management in general.

46

# Terima kasih

47

## National Safety Requirements (Draft)

We are waiting for your effective input for further improvement.  
Please sent your input to the following E-mail address

**E-mail address**  
**dgeujica@yahoo.com**

48



**Terima kasih**  
有り難うございました。



## Appendix 1

### Regulations in Other Countries

- Regulations in Developed Countries
- Regulations in Other ASEAN Countries



### Regulations in Developed Countries



	Japan	U.S.A.	U.K.	Germany	France	Australia (Victoria)
Electric Power Utility Law	Electricity Industry law	State Administration Code	Electricity act 1989	Energy Economy Act 2005	Administrati on Code	Electricity Safety Act
Regulation for Technical Requirement for Power Facilities	Regulation for Technical Requirement for Power Facilities	NESC (National Electrical Safety Code)	The Electricity Safety, quality and Continuity Regulations 2002	DIN-VDE	Governmen t and Minister Order	Electricity Safety Regulation
Regulation institution	Ministry (METI)	State Government (IEEE)	Ministry (DTI)	Ministry (DKE)	Ministry (DIDEME)	State Government (ESV)
Technical Guidelines for Power Facilities	Technical Guidelines for Power Facilities	—	Standard of ENA	—	NF	AS
Standard (Reference)	JIS	ANSI	BS	DIN-VDE	NF	AS
Certification of electric equipment	JIS(PSE)	UL	—	Meister	NF	AS(RCM)



### Regulations in Other ASEAN Countries (1)



	Singapore	Cambodia.	Philippine	Vietnam	Laos	India
Electric Power Utility Law	Electricity act	Electricity law	Republic act	Electricity act	Electricity law	Electricity act
Regulation for Technical Requirement for Power Facilities	Transmission Code	Regulation for Technical Requirement for Power Facilities	Philippine Electrical Code	Regulation for Technical Requirement for Power Facilities	Lao Electric power Technical Standard	Indian Electricity Rules
Regulation institution	Energy Market Authority	Ministry	Energy Regulatory Commission	Ministry	Ministry	Central Electricity Regulatory Commission
Technical Guidelines for Power Facilities	—	Technical Guidelines for Power Facilities	—	Guidelines	Technical Guidelines for Power Facilities	—
Standard (Reference)	Singapore Standard (IEC,BS)	— (IEC)	Philippine National Standard (ANSI)	Vietnam Standard (IEC)	— (IEC)	India Standard (IEC,IEEE)
Certification of electric equipment	CAB	—	PS	VS	—	IS



### Regulations in Other ASEAN Countries (2)



Countries which does not have National Regulation for Technical Requirements for Power Facilities

	Indonesia	Thailand	Malaysia	Myanmar	Sri Lanka	Bangladesh
Electric Power Utility Law	Electric Power Utility Law	Electricity law	Republic act	Electricity act	Electricity law	Electricity act
Regulation for Technical Requirement for Power Facilities	—	EGAT (Utility's Regulation )	—	—	—	—
Regulation institution	—	EGAT	—	—	—	—
Technical Guidelines for Power Facilities	—	EGAT	—	—	—	—
Standard (Reference)	SNI, SPLN (IEC)	TIS (ANSI)	— (IEC)	— (IEC, BS)	— (IEC, BS, IEEE)	Bangladesh Standard (IEC, BS)
Certification of electric equipment	SNI	TIS	SIRIM	—	—	Bangladesh Standard



## Appendix 2



### Comparison between Indonesian and Japanese Legal System

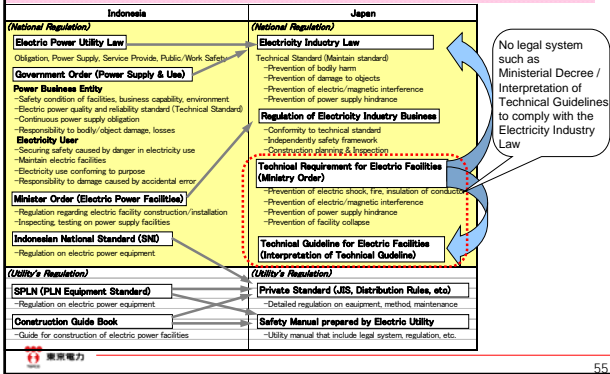




# Japan's Legal System on Electrical Safety



## Legal System Comparison between Indonesia and Japan



### 1.3 3<sup>rd</sup> Seminar (October 13, 2009)

**SUSUNAN ACARA SEMINAR KE - 3**  
**“DEVELOPMENT OF TECHNICAL STANDARDS AND COMPETENCY STANDARDS IN**  
**ELECTRICAL POWER SECTOR IN INDONESIA”**

Selasa, 13 Oktober 2009

Waktu	Acara	Pelaksana
09.00 – 09.30	Pendaftaran peserta	Panitia
09.30 – 09.50	Pembukaan : a. Sambutan dari <i>Embassy of Japan</i> b. Sambutan dan Pembukaan oleh Direktur Jenderal Listrik dan Pemanfaatan Energi	<i>Mr. Takehiro Tsuchiya</i> <i>(Secretary Embassy of Japan)</i> Ir. J. Purwono, M.S.E.E
09.50 – 10.00	Rehat	Panitia
10.00 – 11.00	Presentasi : 1. <i>Progress of the Study</i> 2. <i>National Safety Requirements</i> 3. <i>Engineering Manager System and</i> <i>Safety Rules</i>	<i>JICA Study Team</i>
11.00 – 11.50	Diskusi	Moderator : Ir. Arief Indarto, MM. Ditjen Listrik dan Pemanfaatan Energi DESDM
11.50 – 12.00	Penutupan	Mr. Yoshitaka SAITO <i>JICA Expert on Electric Power and</i> <i>Energy Policy</i>
12.00 – selesai	Makan Siang	Panitia



## The Study on Development of Technical Standards and Competency Standards in Electrical Power Sector in Indonesia

- Presentation for the 3<sup>rd</sup> Seminar -

13<sup>th</sup> October 2009  
JICA Study Team

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1



## Table of Contents

- I. About the 4<sup>th</sup> Field Study in Indonesia
- II. *National Safety Requirements*
- III. *Engineering Manager System*
- IV. *Safety Rules*

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2



## I. About the 4<sup>th</sup> Field Study in Indonesia


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## Overall Work Plan and the 4<sup>th</sup> Field Study

Major Works	Japanese FY 2008												Japanese FY 2009						Japanese FY 2010					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Information & Data Collection & Analyses	[Progress]												[Progress]						[Progress]					
Technical Standard	[Progress]												[Progress]						[Progress]					
Technical Competency	[Progress]												[Progress]						[Progress]					
Electric Power Qualification System	[Progress]												[Progress]						[Progress]					
Field Study	[Progress]												[Progress]						[Progress]					
1st	[Progress]												[Progress]						[Progress]					
2nd	[Progress]												[Progress]						[Progress]					
3rd	[Progress]												[Progress]						[Progress]					
4th	[Progress]												[Progress]						[Progress]					
5th	[Progress]												[Progress]						[Progress]					
6th	[Progress]												[Progress]						[Progress]					


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4




## Main Activities in the 4<sup>th</sup> Field Study

1. Finalization of Draft *National Safety Requirements* [ 5<sup>th</sup> week of September - 1<sup>st</sup> week of October ]
2. Discussion on the Tasks and Responsibilities of *Engineering Manager* [ 2<sup>nd</sup>, 3<sup>rd</sup> week of October ]
3. 3<sup>rd</sup> Steering Committee [ 8<sup>th</sup> October ]
4. Workshop on *National Safety Requirements* [ 9<sup>th</sup> October ]
5. 3<sup>rd</sup> Seminar of the Study [ 13<sup>th</sup> October ]
6. Discussion on Legislating *Engineering Manager System* and Required Competency for *Engineering Manager* [ 2<sup>nd</sup>-4<sup>th</sup> week of October ]

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5



## Outline of the Study Team's Proposal

**Circumstantial Changes**

- Deregulation of power sector [diversified players]
- Diversification of specifications and standards

**[Required Institutional Framework]**


- Redefinition of roles of the Government and power utilities
- National regulation (guidelines) as common platform

**Current Situation**

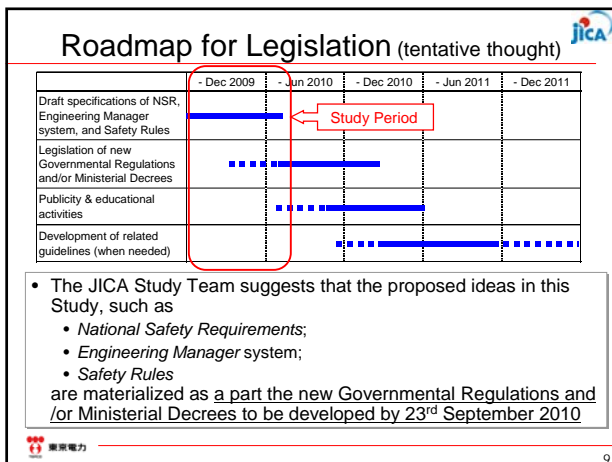
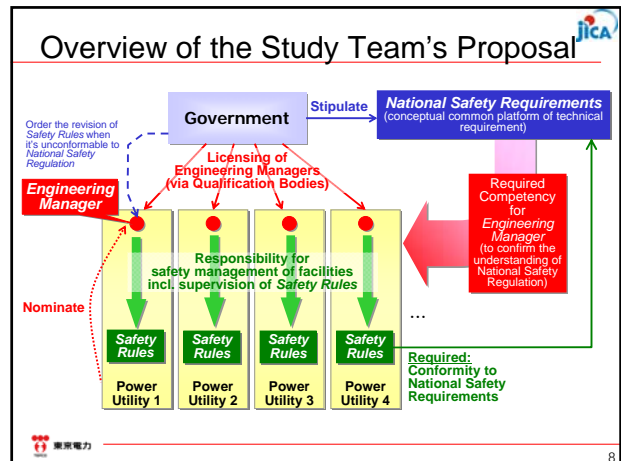
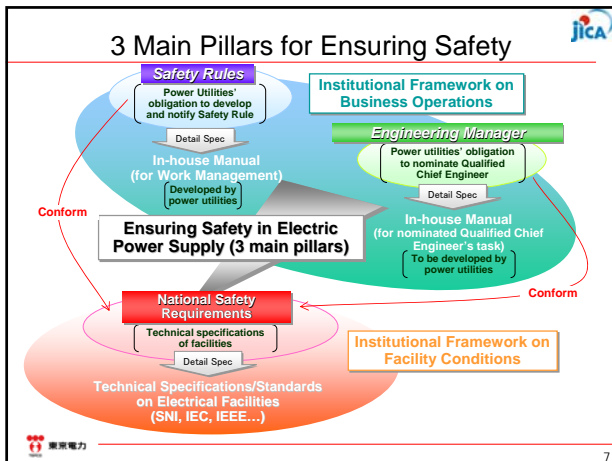
- Laws and regulations
  - No fundamental concept on safety above specifications
- National Standard (SNI)
  - Underdeveloped (only covering in-house wiring)
  - Technical specification but no conceptual "common platform"
- Facility inspection
  - No common platform between inspectors and facility owners
- Competency standard
  - Not prepared for managers

**Study Team's Proposal**

- *National Safety Requirements*
  - Common platform of safety that all power utility must conform to
- *Engineering Manager*
  - Each utility nominates an *Engineering Manager* who is responsible for safety management of facility-ies
- *Safety Rules*
  - Outline of power utility's action plan on carrying out operations for securing safety, to be made public

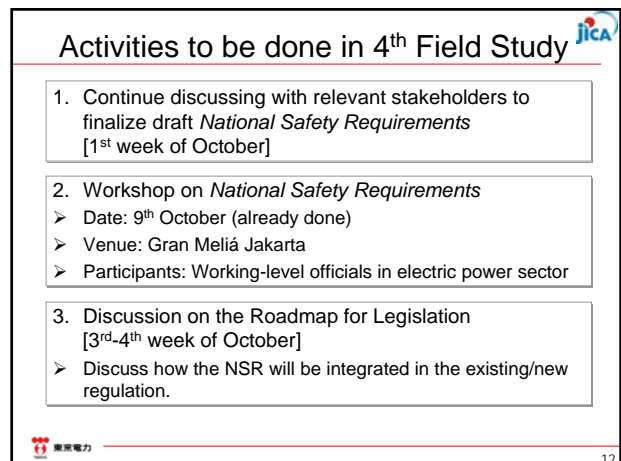
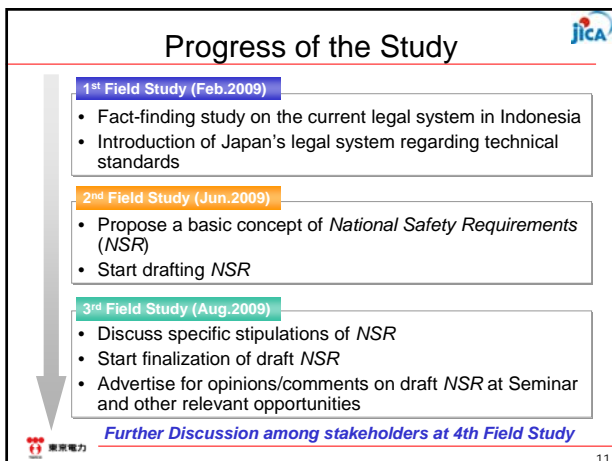
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6



## II. National Safety Requirements

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## Outline of National Safety Requirements

**4 principles for safety on electric power facilities**

- Prevention of Electric Shock or Fire at Electric Facilities
- Prevention of abnormal condition
- Prevention of electrostatic or electromagnetic induction
- Prevention of failure of power supply

↓

- **Requirements for installation of electric network system**  
Insulation, Minimum clearance, Prevention of collapse of electric pole etc.
- **Requirements for common generating facilities**  
Installation of Hydrogen-cooled Generators, Mechanical strength of Generators etc.
- **Requirements for hydro power generation**  
Strength, Materials, Stability and Construction of Dam body etc.
- **Requirements for thermal power generation**  
Structure of Steam turbines, Gas turbines, Internal combustion engines etc.

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## Discussion for Legislation

**Current Legal System on Safety**

- Electricity Law (Supply, Utilization, Facility, Standardization)
- Governmental Regulation on Power Supply & Utilization
- Ministerial Decree for Electric Power Facilities
- SNI(PUIL2000), IEC, etc.

**Future (tentative image)**

- New Electricity Law
- New Governmental Regulation on Safety (NSR)
- SNI(PUIL2000), IEC, or "Power Facility Guideline(New)"

↓

- National Safety Requirements (NSR) proposed by the JICA Study Team need to be brought into the new "Governmental Regulation on Safety" and/or its subordinate Ministerial Decree

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## III. Engineering Manager System

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## Progress of the Study

↓

- 1<sup>st</sup> Field Study (Feb.2009)**
  - Analyzing current status in Indonesia (Competency standards, certification framework, facility inspection)
  - Introducing Japan's Chief Electrical Engineer system
- 2<sup>nd</sup> Field Study (Jun.2009)**
  - Proposing *Engineering Manager* system for clearly identifying responsibility for securing safety
- 3<sup>rd</sup> Field Study (Aug.2009)**
  - Agreeing on the development of competency requirements and certification system presuming the implementation of *Engineering Manager* system
  - Starting discussion on the tasks and responsibilities of *Engineering Manager* with related stakeholders (MEMR Training Centre, P3B, Indonesian Power, JASA Sertifikasi, PLN Training Centre, HAKIT, IATKI etc.)

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## Tasks to be done in the 4<sup>th</sup> Field Study

1. Continue discussing with relevant stakeholders to confirm the tasks and responsibilities of *Engineering Manager*
2. Grasp the status of inspection on electricity supply facilities to identify the issues to be improved
3. Start discussion on the required competency for *Engineering Manager*
4. Present the concept of *Safety Rules* and discuss how to institutionalize *Safety Rules* in Indonesia, especially caring about the relation with the responsibilities of *Engineering Manager* system
  - ✓ *Safety Rules*: overall policy of securing safety in operation and maintenance to be pledged to the public by each public utility
5. Start discussion for legislating *Engineering Manager* system and *Safety Rules*

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## Work Plan of the Study (Developing *Engineering Manager* System)

Timeline: Aug '09, Oct '09, Dec '09, Feb '10

- Aug '09**
  - Share the understanding of the overall structure of *Engineering Manager* System
  - Define the roles and responsibilities of *Engineering Manager*
  - Compose linkage with existing laws and *National Safety Requirements*
- Oct '09**
  - Estimate the impact of implementing *Engineering Manager* System (e.g. total number of necessary *Engineering Managers*)
  - Draft legal provisions on the roles and responsibilities of *Engineering Manager*
  - Inventory required competency for *Engineering Manager*
  - Define the types of *Engineering Manager*
  - Identify executing bodies for certification
  - Finalize legal provisions of *Engineering Manager* System
- Dec '09**
  - Design the structure of competency components (set of required components)
  - Design the roadmap for implementing *Engineering Manager* System (incl. transitional period for full implementation, when needed)
- Feb '10**
  - Prepare human capacity development programs for *Engineering Manager*

Legend: □ : Main outcomes of the Study

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### Current Situation in Indonesia

**Deregulation of Power Sector in Indonesia**

- Transition from old system to current "Diversified structure" with various players in the sector
- For promoting efficiency, the main objective of deregulation, roles should be clearly separated between the Government and public utilities so that safety of electricity facilities should be maintained on the responsibility of each power utility

**Transition of Power Sector Structure (example: Java-Bali Area)**

Old system: Generation, Transmission, Distribution

Current (diversified structure): IP, PJB, IPPs, P3B-JB, Distribution Offices (PT PLN)

Safety on each power utility's responsibility

### Outline of Engineering Manager System

- Considering the diversification of players in the power sector of Indonesia, the responsibility for safety management of each electricity facility should be clarified
- The Study Team proposes Engineering Manager system based on Japan's Chief Electrical Engineer system
- Engineering Manager is obliged to manage the safety of the electricity facility in conformity to National Safety Requirements

Current System: Government, PLN, IPPs

New System: Government, Certification and Supervision, Discretion and responsibility in safe management of facilities

### Safety Management with Engineering Manager System

Government: Entrust, Report, Prescribe, Conform

Inspector: Report / Notify, Inquire (whenever needed), Reply, Advise, Nominate

Power Utility (General Manager): Report, Advise, Nominate, Supervise

Engineering Manager: Supervise, Report

Safety Rules: Construction, Maintenance, Operation

Electrical Facility-ies

### Positioning of Engineering Manager

- Positioning of Engineering Manager in an organization will not be explicitly provided in regulations, and is up to each power utility's discretion taking into account its own organizational structure and staff capacity, such as...

(Type 1) Establish new position (equivalent of Deputy GM)

(Type 2) Assumed by the existing Deputy GM

(Type 3) Assumed by the existing EHS Manager

(Type 4) Assumed by the all-mighty GM

Plant Manager / General Manager

Engineering Manager: Supervise overall safety comprehensively in overview

Deputy General Manager

Enviro/Health Safety Manager, Maintenance Manager, Technical Manager, Operation Manager, HR/Administration Manager, Fuel Manager

Members: Supervise daily operation on safety within the assigned duties

### Positioning of Engineering Manager (cont'd)

- Though the laws and regulations will not directly intervene into the positioning of Engineering Manager in an organization, the Government expects the person who assumes that position to play roles of:
  - Technically advisor to the General Manager, whose main responsibility is administration of the organization, to provide appropriate information from technical aspects;
  - Supervisor/coordinator on safety management for the line managers who are primarily responsible for carrying out the staff's activities with care for safety;

Naming of Engineering Manager in Indonesian regulation is still open for discussion (not yet finally determined)

Suggestions from Indonesian side is highly appreciated

### Main Tasks of Engineering Manager

- I. Operation**
  - Development of annual activity plan on safety management;
  - Supervision for submission of application / notification documents to the authority;
  - Supervision and assessment of safety rules and manuals;
  - Planning and implementation of safety education
  - Attendance to meetings related to safety management
  - Supervision for safety trouble response
- II. Construction**
  - Supervision of facility construction plan and safety works
  - Assessing the conformity of construction designing to NSR
  - Site investigation during construction works;
  - Inspection before commissioning;
- III: Maintenance**
  - Assessment of the condition of facilities in operation (Site Investigation)
  - Supervision of the revision of site patrol rules
  - Attendance at mandatory onsite inspection carried out by the Inspector
  - Supervision of safety works for repairing

## Issues to be Noted

Subjects need to be discussed during this 4<sup>th</sup> field study

- The organization responsible for construction and O&M are different in Indonesia
  - ✓ Licenses for Construction and O&M should be divided?
- The coverage area for one Engineering Manager in the Organization
  - ✓ Where and how many Engineering Managers should be posted ?
- The appropriate position of Engineering Manager
  - ✓ Duplication & conflict of current assignment of manager
- Entrust safety management to the engineer from out of the companies
  - ✓ If there are NOT any appropriate engineers in the organization.

25

## Competency Standard for *Engineering Manager*

- The Government (via Qualification Bodies) provides certification to *Engineering Manager*, based on the Competency Standard that is developed for confirming:
  - Their understanding of *National Safety Requirements*, the common platform of technical requirements (to be specified in the next slide);
  - Their ability of developing *Safety Rules* for their own facilities, which must conform to *National Safety Requirements*
- Power utilities that fail to nominate a “certified” *Engineering Manager* are penalized.
- The nominated *Engineering Manager* whose activities fail to comply with *National Safety Requirements* is also penalized

26

## Required Competency for *Engineering Manager*

A set of competency required for *Engineering Manager*

**1<sup>st</sup> Step Basic Competency**

- Basic theories of electricity
- Understanding of rules for safety
- Enlightenment for safety Issues
- Reporting to regulators/Authorities

**2<sup>nd</sup> Step Competency For Specific Facilities**

Specific Power Facilities

- Hydro Power Civil
- Hydro Power Mech & Elec
- Thermal Power
- Transmission & Substation
- Distribution

- Technical Knowledge**
  - Electrical Theory
  - Automation control
- Construction**
  - Planning & Designing
  - Construction Works
- Operation**
  - Operation Management
  - Trouble Responses
- Maintenance**
  - Inspection & its Tours
  - Repairing Works

## Required Competency for *Engineering Manager* (cont'd)

Assessment of certifying/licensing *Engineering Manager* applicants

- *Engineering Manager* should be classified and posted by each facilities as follows.
  - Hydro Power (Civil engineering, Mechanical & Electrical)
  - Thermal Power
  - Transmission & Substation
  - Distribution
- To be *Engineering Manager* there are two steps assessments, first they need to pass “**Basic Competency**” and only the engineers they passed it can try “**Specific Facilities Competency**” to obtain that licenses
- Assessments should be made both with “**writing exam**” and “**verbal interview**”.
- Relevant work experiences and existing competency licences should be considered as a point to be assessed

28

## Executing Bodies for Certification

- Certification services for *Engineering Managers* should be entrusted to existing Certification Bodies; IATKI, GEMA PDKB, HAKIT or HATEKDIS.

*Reasons;*

1. Principally, DGEEU should implement certification services as the regulatory agency, but it does not have residual resources.
2. On the other hand, existing Certification Bodies have actual performances for certifying NQF level 1 to 3.
3. Also, Certification Bodies have enough experiences to evaluate and hire the scholastic professions or experienced persons in Power Sector as the assessors.
4. So, it is reasonable to utilize the existing bodies' resources for certifying *Engineering Managers*.

29

## Discussion for Legislation

- What should be stipulated in laws and regulations for establishing *Engineering Manager* system will be discussed in detail during the 4<sup>th</sup> Field Study
  - Public utility's obligation to nominate *Engineering Manager*
  - Certification/Licensing of qualified person as *Engineering Manager*
  - Tasks and responsibilities of *Engineering Manager*
    - ✓ Accountability for the safety management of facility/ies as the counterpart of the Inspector entrusted by the Government
    - ✓ Supervision of reporting on accidents to the Government
  - Development of *Safety Rules* and notification to the Government
    - ✓ *Engineering Manager*'s responsibility for overall supervision
  - Penalties
    - ✓ Against the *Engineering Manager*
    - ✓ Against the public utility

30



## IV. Safety Rules

## Outline of Safety Rules

- *Safety Rules* are the operational principles which Power Utilities must follow
- *Safety Rules* are made public as the power utility's pledge to carry out operations in this manner
- Main contents of the *Safety Rules* are as follows
  1. Organizational Structures to secure the safety of Electrical Facilities
  2. Systematic Chain of Direction / Supervision
  3. Assigned Duties of each Departments
  4. Measures and Intervals regarding regular Patrol and Investigation

## Significance of Publicizing *Safety Rules*

- *Safety Rules* presents in public tasks to be done by a power utility for ensuring safety of electrical facilities in a general manner (not in detail) and must be submitted to the Government

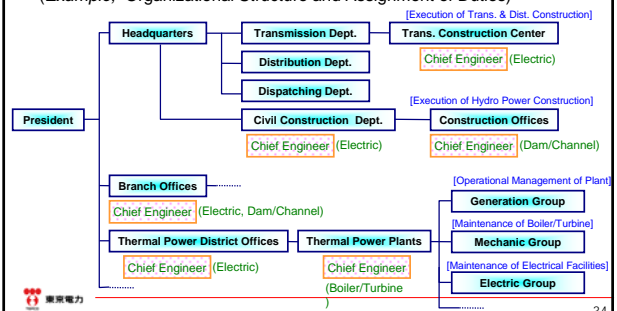
Significances;

1. Submitting *Safety Rules* is equal to **declaring** that Power Utilities promise to ensure the safety of Electrical Facilities
2. Governing Ministry can **order the amendment of *Safety Rules*** in case that there are flaws in it for ensuring the safety
3. **Detailed in-house manuals are established based on *Safety Rules*** by each Power Utilities according to their organizational structures and business operations
4. **Power Utilities are motivated** if *Safety Rules* must be established at their own discretion

## Organizational Structure to Secure Safety (Japan's Case)

- A key point of *Safety Rules* is to clearly define the roles and tasks in an organization for securing safety

(Example; Organizational Structure and Assignment of Duties)



## *Safety Rules* (Japan's case)


- In Japanese regulation, each power utility is obliged to develop its own *Safety Rules* that include the following 15 items and to notify to the Government
- Background concept: **Securing safety in power utility's autonomy**

1. Relevant laws and regulations for Safety and managerial setup for observing *Safety Rules*
2. Assigned duties and organizational structures
3. Scope of work of Qualified Chief Engineer, its specifications, his/her authority and position in the organization
4. Educational activities on safety for the staff
5. Measures for systematically implementing and improving safety-related works on power generating facilities
6. Procedures to develop, modify, approve and archive relevant documents for safety on power generating facilities
7. Status of abovementioned documents related to *Safety Rules*
8. Appropriate records on safety
9. Patrol, inspection and investigation for safety
10. Operation and handling of electrical facilities for power utility
11. Procurement of equipment and services for power generating facilities from outside
12. Conservation of power generating facilities that suspend operation for a long period
13. Measures to be taken in disaster or in other kinds of state of emergency
14. Periodical review of *Safety Rules* and necessary amendments
15. Other issues related to safety


## Proposal of the Study Team: Three Options

- Stipulating mandatory *Safety Rules***  
Specifications of *Safety Rules* are stipulated as a part of laws/regulations. Power Utilities are obliged to develop their in-house manuals in full-compliance to mandatory *Safety Rules*.
- Providing a template of *Safety Rules***  
The Government provides a template of *Safety Rules* that Power Utilities can refer to when they develop their own *Safety Rules*. *Safety Rules* need to be submitted to the Government for approval before taking effect.
- Power Utilities develop their own *Safety Rules***  
Specifications of *Safety Rules* provided in laws/regulations are minimized. Power Utilities are requested to develop their *Safety Rules* at their discretion and notify to the Government.



**Evaluation of Three Options** 

a. Stipulating mandatory <i>Safety Rules</i>	b. Providing a template of <i>Safety Rules</i>	c. Power utilities develop their own <i>Safety Rules</i>
<ul style="list-style-type: none"> <li>- The Government is responsible for preparing the whole contents of <i>Safety Rules</i></li> <li>- Power utilities are obliged to follow literally the provided <i>Safety Rules</i>, i.e. their in-house operational manuals must fully conform to <i>Safety Rules</i></li> </ul>	<ul style="list-style-type: none"> <li>- The Government provides a template (=guidelines)</li> <li>- Based on that power utilities prepare and submit <i>Safety Rules</i>, which do not take effect unless approved by the Government</li> <li>- Power utilities can propose a variation to the template as far as it has justified reasons</li> </ul>	<ul style="list-style-type: none"> <li>- Power utilities prepare and submit their own <i>Safety Rules</i> on their own initiative</li> <li>- <i>Safety Rules</i> take effect right upon submission and the Government's intervention is minimized, though minor amendment may be requested occasionally</li> </ul>
<ul style="list-style-type: none"> <li>• Discussion for evaluating these options is still underway, though at the moment the JICA Study Team is in favour of Option b as recommendation</li> </ul>		
<ul style="list-style-type: none"> <li>• Providing comments and suggestions from Indonesian side to serve for this discussion is highly appreciated</li> </ul>		


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# Terima Kasih

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38



## Studi untuk Pengembangan Standar Teknis dan Standar Kompetensi Ketenagalistrikan di Indonesia

- Materi Presentasi untuk Seminar ke-3

13 Oktober 2009  
JICA Study Team

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1




### Daftar Isi


- I. Studi Lapangan ke-4
- II. Persyaratan Keselamatan Nasional (NSR: *National Safety Requirements*)
- III. Sistem Manajer Teknik (EM: *Engineering Manager*)
- IV. Aturan Keselamatan (SR: *Safety Rules*)

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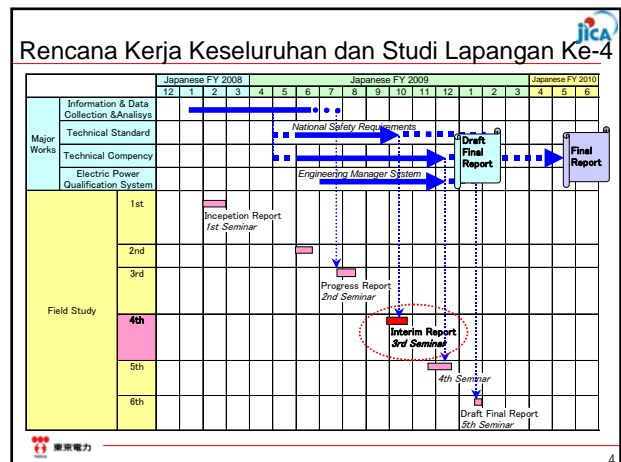
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## I. Studi Lapangan Ke-4


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3



### Kegiatan Utama dalam Studi Lapangan ke-4

1. Finalisasi R-NSR [ Minggu ke-5 Sep s/d Minggu ke-1 Okt]
2. Diskusi tentang Tugas dan Tanggungjawab EM [ Minggu ke-2 & ke-3 Okt ]
3. Komite Pengarah/Steering Committee ke-3 [ 8 Oktober ]
4. Workshop tentang NSR [ 9 Oktober ]
5. Seminar ke-3 [ 13 Oktober]
6. Diskusi tentang penetapan sistem dan kompetensi EM [ Minggu ke-2 s/d ke-4 Okt]

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5

### Garis Besar Proposal Tim

**Perkembangan kondisi**

- Deregulasi sektor TL [diversifikasi pelaku usaha]
- Diversifikasi spesifikasi dan standar

**[Kerangka kelembagaan yang diperlukan]**

- Redefinisi peranan pemerintah dan utilitas TL (tenaga listrik)
- Aturan Nasional (pedoman) sebagai platform umum

**Situasi saat ini**

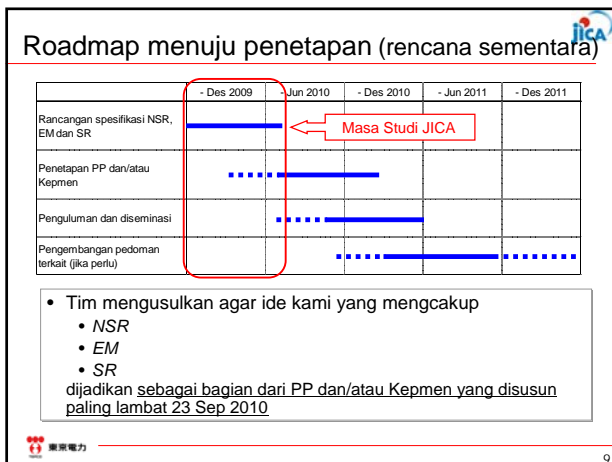
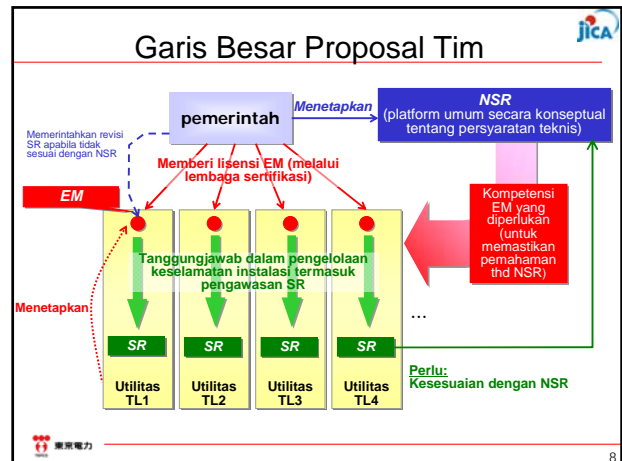
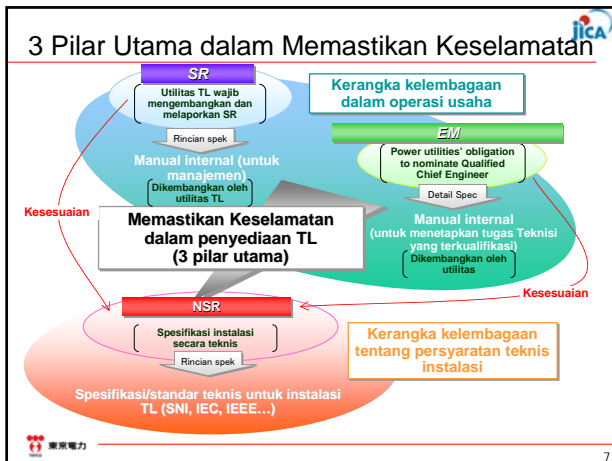
- Perundang-undangan
  - Tidak ada konsep keselamatan yang memayungi ketentuan spesifikasi
- Standar Nasional (SNI)
  - Belum berkembang (hanya mencakup pengawatan/pemasangan instalasi)
  - Ada spesifikasi teknis tetapi tidak ada "platform umum" belum ada
- Inspeksi instalasi
  - Tidak ada platform antara inspektur dengan pemilik instalasi
- Standar kompetensi
  - Belum tersedia bagi manajer

**Proposal Tim**

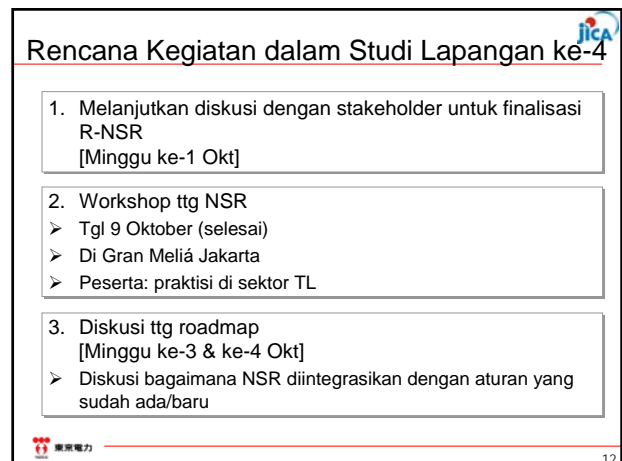
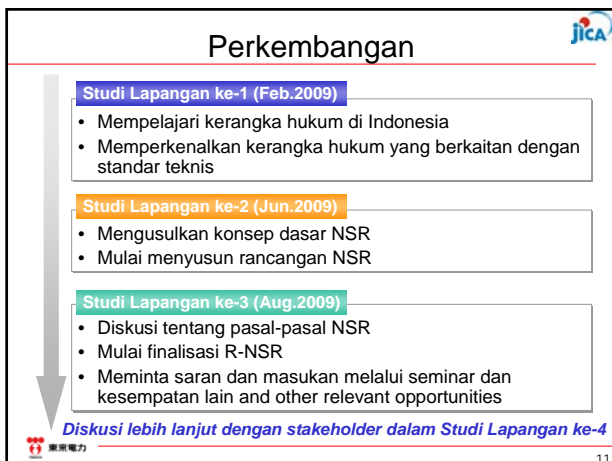
- **NSR**
  - Platform umum tentang keselamatan yang harus diikuti utilitas TL
- **EM**
  - Setiap utilitas menetapkan EM yang bertanggungjawab dalam pengelolaan keselamatan instalasi
- **SR**
  - Garis besar rencana tindak bagi utilitas dalam melaksanakan operasi untuk keselamatan, yg diumumkan.

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6



## II. NSR



## Garis Besar NSR

**4 prinsip dalam keselamatan instalasi TL**

- Mencegah sengatan listrik atau kebakaran pada instalasi TL
- Mencegah kondisi luar biasa
- Mencegah induksi elektrostatis atau elektromagnetik
- Mencegah gangguan/kegagalan penyediaan TL

- **Persyaratan untuk instalasi penyaluran**  
Isolasi, jarak bebas, pencegahan kerobohan tiang listrik dll
- **Persyaratan untuk instalasi pembangkitan**  
Instalasi generator yang berpendingin hydrogen, kekuatan mekanis generator dll
- **Persyaratan untuk PLTA**  
Kekuatan, material, stabilitas dan konstruksi badan bendungan dll
- **Persyaratan untuk PLTU**  
Struktur turbin uap, turbin gas, mesin pembakaran internal dll

13

## Diskusi tentang legislasi

**Kerangka saat ini**

UU Ketenagalistrikan  
(penyediaan, pemanfaatan, instalasi, standarisasi)

**Ke depan (imej sementara)**

UU Ketenagalistrikan yang baru

- NSR yang diusulkan Tim perlu ditetapkan dalam PP dan/atau Permen baru

14

# III. EM

15

## Perkembangan Studi

**Studi Lapangan ke-1 (Feb.2009)**

- Analisa status Indonesia saat ini (standar kompetensi, kerangka sertifikasi, inspeksi)
- Memperkenalkan sistem Manajer TL di Jepang

**Studi Lapangan ke-2 (Jun.2009)**

- Mengusulkan sistem EM dalam rangka identifikasi tanggungjawab dalam keselamatan

**Studi Lapangan ke-4 (Aug.2009)**

- Sepakat untuk mengembangkan persyaratan ko.petensi dan sistem sertifikasi dalam rangka persiapan implementasi sistem EM
- Mulai diskusi ttg tugas dan tanggungjawab EM dengan stakeholder (Pusdiklat DESDM, P3B, IP, JASA Sertifikasi, Pusdiklat PLN, HAKIT, IATKI dll.)

16

## Rencana Kegiatan dalam Studi Lapangan ke-4

1. Melanjutka diskusi dgn stakeholder untuk memastikan tugas dan tanggungjawab EM
2. Mempelajari kondisi inspeksi instalasi penyediaan TL dalam rangka identifikasi permasalahan yang harus diatasi
3. Mulai diskusi ttg kompetensi EM yang diperlukan
4. Memperkenalkan konsep SR dan diskusi bagaimana institutionalisasi SR di Indonesia, khususnya keterkaitan dengan tanggungjawab EM
  - ✓ SR: kebijakan secara keseluruhan ttg keselamatan operasi dan pemeliharaan yang harus dilaporkan oleh setiap utilitas TL
5. Mulai diskusi ttg penetapan EM dan SR

17

## Rencana Kerja (dalam pengembangan EM)

**Aug '09**

- Berbagi pemahaman ttg sistem EM secara keseluruhan
- Definisi peran dan tanggungjawab EM
- Menyusun keterkaitan antara aturan yang sudah ada dengan NSR

**Okt '09**

- Estimasi dampak implementasi EM (e.g. jumlah EM yang diperlukan)
- Menyusun rancangan aturan ttg peran dan tanggungjawab EM
- Inventarisir kompetensi EM yang diperlukan
- Definisi jenis EM
- Identifikasi lembaga sertifikasi
- Finalisasi aturan ttg EM

**Des '09**

- Merancang struktur komponen kompetensi (menyimak komponen yang diperlukan)
- Merancang roadmap dalam implementasi EM (termasuk masa transisi menuju implementasi secara penuh jika perlu)

**Feb '10**

- Mempersiapkan program pengembangan SDM untuk EM

□ : Hasil utama dalam Studi

18

## Situasi Indonesia saat ini

### Deregulasi sektor TL di Indonesia

- Perkembangan dari sistem lama menjadi struktur terdiversifikasi dimana berbagai pelaku usaha berada

- Tujuan utama deregulasi dalam rangka meningkatkan efisiensi, peran harus dipisahkan antara pemerintah dengan utilitas publik agar keselamatan instalasi TL dapat dipertahankan atas tanggungjawab setiap utilitas TL

**Perkembangan struktur sektor TL (contoh wilayah Jawa-Bali)**

**Sistem lama**

**Saat ini (terdiversifikasi)**

## Garis Besar Sistem EM

- Mengingat situasi diversifikasi saat ini di Indonesia, **tanggungjawab atas pengelolaan keselamatan** bagi setiap instalasi TL harus diklarifikasi
- Tim mengusulkan **Sistem EM** berdasarkan dengan sistem Teknisi di Jepang (Japan's Chief Electrical Engineer system)
- EM wajib mengelola keselamatan instalasi TL dengan memenuhi **NSR**

**Sistem saat ini**

**Sistem baru**

## Pengelolaan Keselamatan dengan Sistem EM

## Penempatan EM

- Penempatan EM di organisasi tidak diatur secara jelas dalam regulasi, tetapi tergantung pertimbangan setiap utilitas TL berkaitan dengan struktur organisasi dan kemampuan seperti:

## Penempatan EM (lanjutan)

- Walaupun penempatan EM tidak diatur secara jelas di regulasi, pemerintah berharap seseorang yang memainkan peranan:
  - Penasehat teknis kepada General Manager, dimana tanggungjawab utama adalah memberi informasi yang sesuai
  - Supervisor/coordinator dalam pengelolaan keselamatan bagi manajer terkait yang bertanggungjawab atas kepastian keselamatan yang ditangani oleh bawahannya

- Sebutan EM masih dapat dipertimbangkan/diskusikan (belum ditetapkan)
- Usulan dari pihak Indonesia sangat diharapkan

## Tugas Utama EM

- I. Operasi**
  - Mengembangkan rencana tahunan di bidang pengelolaan keselamatan
  - Mengawasi penyampaian/pelaporan dokumen ke instansi berwenang
  - Mengawasi dan menilai SR dan manualnya
  - Merencanakan dan melaksanakan pendidikan keselamatan
  - Menghadiri rapat yang berkaitan dengan pengelolaan keselamatan
  - Mengawasi tindakan keselamatan terhadap masalah
- II. Konstruksi**
  - Mengawasi rencana konstruksi instalasi dan pekerjaan yang aman
  - Menilai kesesuaian rancangan konstruksi dengan NSR
  - Investigasi lapangan selama konstruksi
  - Inspeksi prakomisioning
- III. Pemeliharaan**
  - Menilai kondisi instalasi dalam operasi (investigasi lapangan)
  - Mengawasi revisi aturan apel lapangan
  - Menghadiri inspeksi wajib yang dilakukan oleh Inspektur
  - Mengawasi pekerjaan perbaikan yang aman

## Permasalahan yang diperhatikan

Topik yang perlu dibahas dalam Studi Lapangan ke-4

- Organisasi yang bertanggungjawab di bidang Operasi & Pemeliharaan dengan Konstruksi berbeda di Indonesia
- ✓ Lisensi untuk Konstruksi dan Operasi & Pemeliharaan harus dipisahkan?
- Cakupan bagi seorang EM dalam organisasi
- ✓ Dimana dan berapa EM yang harus ditempatkan?
- Posisi yang tepat bagi EM
- ✓ Timpang tindih dan konflik dengan manajer yang sdh ada
- Penunjukkan Teknisi pihak luar
- ✓ Apabila tidak terdapat teknisi yang sesuai

25

## Standar Kompetensi utk EM

- Pemerintah (melalui lembaga sertifikasi) memberi sertifikasi kepada EM, berdasarkan dengan standar kompetensi dengan memenuhi syarat:
  - Pemahaman thd NSR, platform umum utk persyaratan teknis (rincian lihat slide berikutnya)
  - Kemampuan dalam mengembangkan SR bagi instalasinya, yang sesuai dengan NSR
- Utilitas TL yang menetapkan Engineering Manager yang tidak sesuai dikenai sanksi
- Engineering Manager yang ditunjuk yang tidak memenuhi National Safety Requirements juga dikenai sanksi

26

## Kompetensi yang diperlukan bagi EM

Perlu serangkaian kompetensi bagi EM

**Tahap 1 Kompetensi Dasar**

- Basic theories of electricity
- Understanding of rules for safety
- Enlightenment for safety Issue
- Reporting to regulators/Authorities

**Tahap 2 Kompetensi untuk instalasi spesifik**

**Instalasi TL yang spesifik**

- Sipil PLTA
- Mekanik & Elektro PLTA
- PLTU
- Transmisi & GI
- Distribusi

**Pengetahuan Teknis**

- Teori Elektro
- Pengendalian Otomatis

**Konstruksi**

- Perencanaan dan Perancangan
- Konstruksi

**Operasi**

- Pengelolaan Operasi
- Tanggapan thd gangguan

**Pemeliharaan**

- Inspeksi
- Perbaikan

27

## (Lanjutan)

Menilai peserta sertifikasi EM

- EM harus diklarifikasi dan dibagi sesuai dengan instalasi
  - PLTA (sipil, mekanik, elektro)
  - PLTU
  - Transmisi & GI
  - Distribusi
- Untuk menjadi EM, terdapat 2 tahap asesmen. Pertama harus lolos "Kompetensi Dasar" dan peserta yang lolos pada tahap pertama yang dapat mencoba "Kompetensi untuk Instalasi Spesifik" untuk memperoleh lisensi
- Asesmen harus dilakukan melalui "ujian tertulis" dan "ujian wawancara"
- Pengalaman kerja dan sertifikat kompetensi yang sudah ada harus dipertimbangkan sebagai bobot dalam asesmen.

28

## Lembaga Sertifikasi

- Jasa Sertifikasi utk EM harus ditugaskan kepada lembaga sertifikasi yang sudah ada seperti: IATKI, GEMA PDKB, HAKIT atau HATEKDIS.

*Alasan;*

1. Pada prinsipnya, DJLPE harus melaksanakan jasa sertifikasi sebagai regulator, tetapi tidak memiliki sumberdaya
2. Sedangkan lembaga sertifikasi yang sudah ada memiliki kinerja utk melalukan sertifikasi KKNi tingkat 1 s/d 3.
3. Mereka juga memiliki pengalaman yg cukup dalam menilai dan mempekerjakan ahli atau seseorang yang berpengalaman di sektor TL sebagai asesor.
4. Oleh karena itu, lembaga sertifikasi yang sudah ada dapat dimanfaatkan sebagai lembaga sertifikasi untuk EM.

29

## Diskusi untuk penetapan

- Apa yang harus diatur dalam regulasi dalam rangka membangun sistem EM akan dibahas secara detail dalam Studi Lapangan ke-4
  - > Kewajiban utilitas publik untuk menetapkan EM
  - > Sertifikasi seseorang yang berkompeten sebagai EM
  - > Tugas dan tanggungjawab EM
    - ✓ Pertanggungjawaban thd pengelolaan keselamatan instalasi sebagai mitra/counterpart Inspektur yang ditugaskan oleh pemerintah
    - ✓ Pengawasan dalam pelaporan kejadian ke pemerintah
  - > Pengembangan SR dan pelaporan ke pemerintah
    - ✓ Tanggungjawab EM utk pengawasan secara keseluruhan
  - > Sanksi
    - ✓ Thd EM
    - ✓ Thd utilitas publik

30




## IV. SR

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31

## Garis Besar SR

- SR adalah prinsip dalam operasi yang harus diikuti utilitas TL
- SR diumumkan oleh utilitas TL sehingga mereka menjanjikan implementasinya
- Pokok-pokok SR:
  - Organisasi dalam rangka memastikan keselamatan instalasi TL
  - Dalam rantai pengarahan/pengawasan secara sistematis
  - Tugas tiap divisi
  - Cara dan frekuensi patrol rutin dan investigasi

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32

## Makna keterbukaan SR

- SR merupakan apa yang harus dilakukan dalam memastikan keselamatan instalasi TL yang diumumkan secara terbuka (tetapi tidak sampai detail) yang harus dilaporkan ke pemerintah

*Makna*

- Melaporkan SR sama dengan **mendeklarasi** bahwa utilitas TL menjanjikan keselamatan instalasi TL
- Instansi berwenang dapat **memerintahkan revisi SR** apabila terdapat ketidaksesuaian dalam rangka memastikan keselamatan
- Manual operasional internal yang rinci disusun berdasarkan dengan SR** oleh setiap utilitas dengan mempertimbangkan struktur organisasi dan status bisnis.
- Utilitas TL termotivasi dalam mengikuti aturan** apabila SR dikembangkan dengan keleluasan wewenang sendiri.

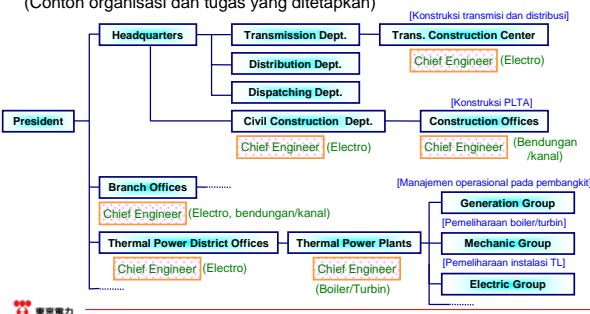
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33

## Organisasi dalam rangka memastikan keselamatan (kasus di Jepang)

- Kunci SR adalah definisi peran dan tugas secara jelas dalam organisasi

(Contoh organisasi dan tugas yang ditetapkan)




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34

## SR (kasus di Jepang)

- Dalam regulasi di Jepang, setiap utilitas TL wajib mengembangkan SRnya termasuk 15 item yang disebut di bawah. SR harus dilaporkan ke pemerintah.
- Dasar pemikiran: **Menjaga keselamatan harus dibawah otonomi utilitas TL**

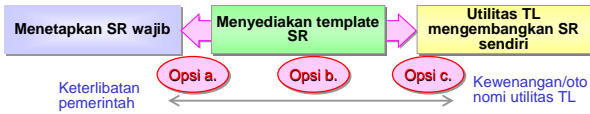
<ol style="list-style-type: none"> <li>Sistem untuk mematuhi perundang-undangan di bidang keselamatan dan Aturan Keselamatan</li> <li>Peran dan fungsi petugas dan organisasinya</li> <li>Lingkup tugas dan kewenangan Teknisi Ketenagalistrikan Utama dan kedudukan di organisasinya</li> <li>Diklat keselamatan untuk petugas</li> <li>Tindakan untuk melaksanakan dan memperbaiki pengamanan bangunan untuk pembangkitan secara terencana</li> <li>Tatacara penyusunan, perubahan, persetujuan dan penyimpanan dokumen yang diperlukan dalam pengamanan instalasi ketenagalistrikan untuk pembangkitan</li> <li>Kedudukan dokumen sebagaimana disebut di dalam Aturan Keselamatan</li> </ol>	<ol style="list-style-type: none"> <li>Pencatatan pengamanan dengan tepat</li> <li>Pemantauan, pemeriksaan dan inspeksi dalam rangka pengamanan</li> <li>Operasi instalasi ketenagalistrikan ketenagalistrikan</li> <li>Pengadaan dan pengelolaan barang dan jasa yang berkaitan dengan pengamanan instalasi ketenagalistrikan untuk pembangkitan</li> <li>Cara pemeliharaan saat pemadaman pembangkit dalam waktu yang lama</li> <li>Tindakan yang harus diambil saat bencana dan kondisi luar biasa lainnya</li> <li>Pemeriksaan Aturan Keselamatan secara berkala dan penyempurnaan</li> <li>Hal-hal lain yang diperlukan dalam pengamanan</li> </ol>
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35

## Proposal dari Tim: 3 Opsi

- Pemerintah menetapkan SR sebagai aturan wajib**  
Spesifikasi SR ditetapkan sebagai bagian dari aturan hukum. Utilitas TL wajib mengembangkan **manual operasional internal yang sepenuhnya sesuai dengan SR** wajib tersebut.wer
- Pemerintah menyediakan template SR**  
Pemerintah menyediakan template (pedoman) SR agar utilitas TL dapat mengacu dalam pengembangan SR sendiri. **SR perlu disetujui pemerintah sebelum diberlakukan.**
- Utilitas TL mengembangkan SR sendiri**  
Mereka hanya diminta agar **mengembangkan SR dengan keleluasan mereka sendiri dan dilaporkan ke pemerintah**




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36



**Evaluasi 3 opsi**



a. Menetapkan SR wajib	b. Menyediakan template SR	c. Utilitas TL mengembangkan SR sendiri
<ul style="list-style-type: none"> <li>- Pemerintah bertanggungjawab untuk mempersiapkan semua isi SR</li> <li>- Utilitas TL wajib mengikuti SR. Manual internal hrs sesuai dengan SR.</li> </ul>	<ul style="list-style-type: none"> <li>- Pemerintah menyediakan template (=pedoman)</li> <li>- Berdasarkan dengan pedoman, utilitas TL mempersiapkan dan menyampaikan SR, yang baru berlaku setelah persetujuan pemerintah</li> <li>- Utilitas TL dapat mengusulkan variasi dari template sepanjang alasan yang dapat diterima</li> </ul>	<ul style="list-style-type: none"> <li>- Utilitas TL mengembangkan SR dengan keleluasan sendiri dan melaporkan ke pemerintah</li> <li>- SR berlaku setelah menyampaikan ke pemerintah. Intervensi pemerintah diminimalisir namun revisi minor dapat diminta.</li> </ul>
<ul style="list-style-type: none"> <li>• Diskusi ttg evaluasi 3 opsi masih berlangsung, namun saat ini Tim menyukai opsi b sebagai rekomendasi.</li> </ul>		
<ul style="list-style-type: none"> <li>• Saran dan masukan dari pihak Indonesia sangat diharapkan.</li> </ul>		



37



# Terima Kasih



38

## 1.4 4<sup>th</sup> Seminar (December 8, 2009)

**SUSUNAN ACARA SEMINAR KE - 4**  
**“DEVELOPMENT OF TECHNICAL STANDARDS AND COMPETENCY STANDARDS IN**  
**ELECTRICAL POWER SECTOR IN INDONESIA”**

Selasa, 8 Desember 2009

Waktu	Acara	Pelaksana
09.00 – 09.30	Pendaftaran peserta	Panitia
09.30 – 09.50	Pembukaan : a. Sambutan dari JICA Indonesia Office  b. Sambutan dan Pembukaan oleh Direktur Jenderal Listrik dan Pemanfaatan Energi	Mr. Hiroyuki KAWANISHI Senior Representative <i>JICA Inodonesia Office</i>  Ir. J. Purwono, M.S.E.E
09. 50 – 10. 00	Coffee break	Panitia
10. 00 – 11.50	Presentasi & QA : <i>1. About the 5th Field Study in Indonesia</i> <i>2. Overview of the JICA Study Team's Proposal</i> <i>3. National Safety Requirements</i> <i>4. Safety Rules</i> <i>5. Engineering Manager System</i> <i>6. Technical Competency for Engineering Manager</i>	<i>JICA Study Team</i>  Moderator : Ir. Arief Indarto, MM. Ditjen Listrik dan Pemanfaatan Energi DESDM
11.50 – 12.00	Penutupan	Mr. Yoshitaka SAITO <i>JICA Expert on Electric Power and Energy Policy</i>
12.00 – selesai	Makan Siang	Panitia



# The Study on Development of Technical Standards and Competency Standards in Electrical Power Sector in Indonesia

- Presentation for the 4<sup>th</sup> Seminar -

8<sup>th</sup> December 2009  
JICA Study Team



## Table of Contents

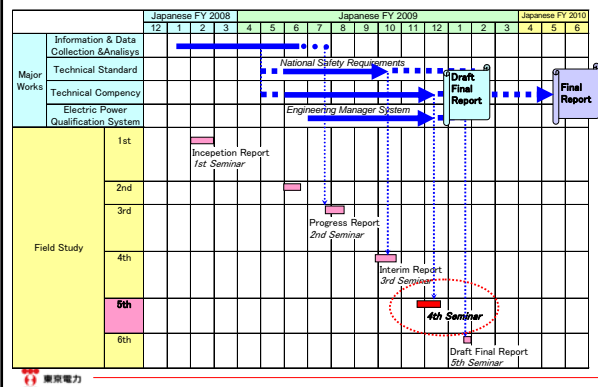
- I. About the 5<sup>th</sup> Field Study in Indonesia
- II. Overview of the JICA Study Team's Proposal
- III. *National Safety Requirements*
- IV. *Safety Rules*
- V. *Engineering Manager System*
- VI. Technical Competency for *Engineering Manager*



## I. About the 5<sup>th</sup> Field Study in Indonesia



## Overall Work Plan and the 5<sup>th</sup> Field Study



## Main Activities in the 5<sup>th</sup> Field Study

1. Discussion on Institutionalizing the Study Team's Proposal [ 3<sup>rd</sup> week of November - 3<sup>rd</sup> week of December ] *Ongoing*
2. Discussion on the Practices of Facility Inspection [ 3<sup>rd</sup> week of November - 1<sup>st</sup> week of December ] *Completed*
3. Site Survey on Electrical Safety Management in Outer-Java-Bali Area [ 4<sup>th</sup> week of November ] *Completed*
4. 2<sup>nd</sup> Workshop on Discussing Technical Competency of *Engineering Manager* [ 1<sup>st</sup> December ] *Completed*
5. 4<sup>th</sup> Steering Committee [ 4<sup>th</sup> December ] *Completed*
6. 4<sup>th</sup> Seminar of the Study [ 8<sup>th</sup> December ]



## II. Overview of the JICA Study Team's Proposal



### The JICA Study Team's Proposal

- The JICA Study Team has so far proposed 3 main pillars for securing safety based on the experience in Japan, i.e. *National Safety Requirements*, *Safety Rules*, and *Engineering Manager* system;
- The JICA Study Team expects that these proposals are taken into account in developing new Regulations and Decrees

<b>National Safety Requirements</b>	: Conceptual common platform of technical requirements for securing safety of electrical facilities	Institutional Framework for Securing Safety
<b>Safety Rules</b>	: Operational principles that each Power Utility must comply with	
<b>Engineering Manager</b>	: Nomination of a qualified person who supervises the overall safety : Improving technical competency of engineers through certification	Capacity Development

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### 3 Main Pillars for Ensuring Safety

**National Safety Requirements**  
Basic/conceptual technical requirements provided by the Government, stipulating how Facilities should be configured for Safety

**Safety Rules**  
Rules developed by each Utility/entity, stipulating How Utility/entity should construct, operate and Maintain Facilities in conformity to NSR

**Engineering Manager**  
Engineering Manager nominated by each Utility/entity, responsible for supervising the overall safety of electrical facility in line with Safety Rules

Electrical Power Facilities

Utilities/Entities

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### III. National Safety Requirements

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### Current Situation in Indonesia (Java-Bali's case)

Utilization facilities: Distribution, Transmission & Substation, Generation

Standards: SNI (PUIL etc.), SPLN, IEC, IEEE, JIS ...

Necessity of providing common conceptual platform for developing National Technical Standards (SNI)

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### Current Situation in Indonesia (Cont'd)

**Facility Inspection**

- A common standard has not been unified which inspectors and facility owners should refer to (Only inspection items are stipulated in Ministerial Decree #45/2005)
- Inspectors and facility owners need to have common platform of a unified standard

Inspector: Ministerial Decrees, No common rules for reference, Facility (SNI, IEC, JIS...)

Inspector: Ministerial Decrees, National Safety Requirements, Facility (SNI, IEC, JIS...)

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### The JICA Study Team's proposal National Safety Requirements

- National Safety Requirements*, with which any stakeholder in the sector must conform for safety in power supply, needs to be developed as the "common platform"

Common platform to provide superordinate concept of technical specifications / standards

National Safety Requirements for power supply

- Legal System Improvement
- Business Quality Improvement
- Safety Improvement

Conformity with the "Common platform" in developing/referring to standards

SNI National Standard

Other Standards used in Indonesia: IEC, IEEE, JIS ...

SPLN ... Utility's private standard

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## Outline of National Safety Requirements

**Safety principle for electric power facilities**

- Prevention of electric shock or fire at electric facilities
- Prevention of abnormal condition
- Prevention of electrostatic or electromagnetic induction
- Prevention of failure of power supply

↓

- Requirements for installation of electric network system**  
Insulation, Minimum clearance, Prevention of collapse of electric pole etc.
- Requirements for common generating facilities**  
Installation of Hydrogen-cooled Generators, Mechanical strength of Generators etc.
  - Requirements for hydro power generation**  
Strength, Materials, Stability and Construction of Levee Body etc.
  - Requirements for thermal power generation**  
Structure of Steam turbines, Gas turbines, Internal combustion engines etc.

13

## Recommended Action Plan (National Safety Requirements)

- Legislation for institutionalizing *National Safety Requirements* and promotion for full adoption
- Because *National Safety Requirements* basically do not provide numerical criteria, MEMR is suggested to consider developing guidelines to supplement NSR, such as:
  - Linkage of stipulations between NSR and SNI (PUIL) [or other existing technical standards]
- Completion of SNI (PUIL) to cover all the areas of electrical facilities is also strongly recommended

14

# IV. Safety Rules

15

## Current Situation in Indonesia

**Deregulation of Power Sector in Indonesia**

- Transition to "Diversified structure" with various players

↓

- Roles and responsibilities of the Government and utilities should be clearly defined so that the safety of electrical facilities is maintained in compliance with NSR autonomously

**Transition of Power Sector Structure (example: Java-Bali Area)**

	Old system	Current (diversified structure)
Regulation	Government (PLN)	Government (PLN)
Generation	Government (PLN)	IP, PJB, IPPs
Transmission	Government (PLN)	P3B-JB
Distribution	Government (PLN)	Distribution Offices (PT-PLN)

16

## The JICA Study Team's proposal Safety Rules and Engineering Manager

- Based on the observation from the current status, the JICA Study Team proposes the introduction of the following systems:
  - Safety Rules** [operational principles of each power utility]
  - Engineering Manager** [responsible person to supervise safety]

to ensure **autonomous safety management** in conformity to **National Safety Requirements** in a visible way

**Current System**

(Unclear separation of responsibilities)

Government

---

Utilities

What are/aren't supervised & directed?

What are/aren't reported & submitted?

**Proposed System**

Autonomous safety management with NSR, Safety Rules & EM

Government

Utilities

Report

Supervise

Conform

License

Define

NSR

Safety Rules

EM

17

## Outline of Safety Rules

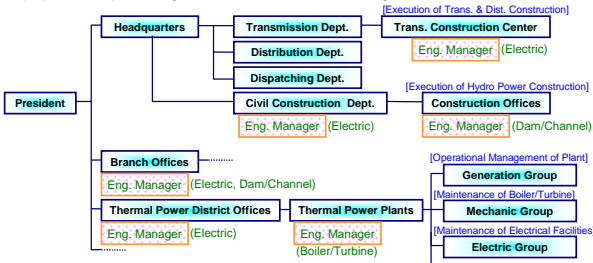
- Safety Rules* are the operational principles prepared by each power utility and submitted to the Government as the power utility's pledge to carry out operations in this manner
- Safety Rules* consist of the following two main rules:
  - Organizational structures to secure the safety of electrical facilities, including the positioning of *Engineering Managers* and assignment of duties
  - Basic rules of construction/operation/maintenance procedure
    - Regular patrol and facility inspection (interval and approaches)
    - Measures to deal with accidents/troubles
- The Government can order the amendment of *Safety Rules* in case the descriptions are insufficient for ensuring safety
- Detailed private manuals of each power utility are established in conformity to *Safety Rules*

18

## Organizational Structure to Secure Safety

- A key point of *Safety Rules* is to clearly define the roles and tasks in an organization for securing safety, especially the positioning of *Engineering Manager*

(Japan's sample of Organizational Structure and Assignment of Duties)

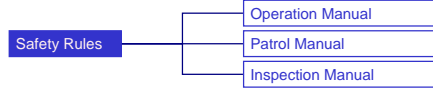


## Basic Rules of O&M Procedure

- Another key point of *Safety Rules* is to clearly define the basic rules of operation & maintenance procedure for securing safety, including measures to deal with accidents/troubles  
[More Details are provided in the power utility's private operational manuals]

(Japan's Case of Regular Patrol and Facility Inspection: sample)

Facility	equipment	Patrol Period	Inspection	
			Item	Period
Hydropower	Dam, Reservoir, Waterways	Once / Month	Exterior Inspection Interior Inspection	Once / year Once / 3years
	Turbine, Generator	Twice / Month	Exterior Inspection Overhaul	Once / 3years Ad hoc



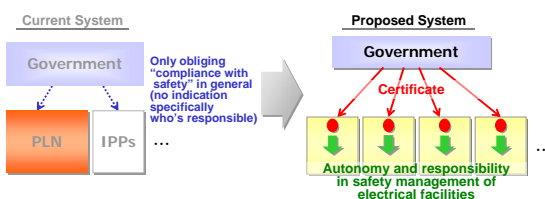
## Recommended Action Plan (*Safety Rules*)

- Legislation for institutionalizing *Safety Rules* and promotion for full adoption
- MEMR is suggested to consider developing guidelines to assist power utilities in preparing *Safety Rules* on their own
- Gradual adoption of *Safety Rules* by prioritizing large-scale power stations (important in terms of impact on safety) may be considered, if full adoption to power suppliers in island areas and/or rural distribution cooperatives at once appears to be difficult
- Discussion on applying *Safety Rules* system to power users' facilities and captive power needs to be considered as the next step after the completion of this Study

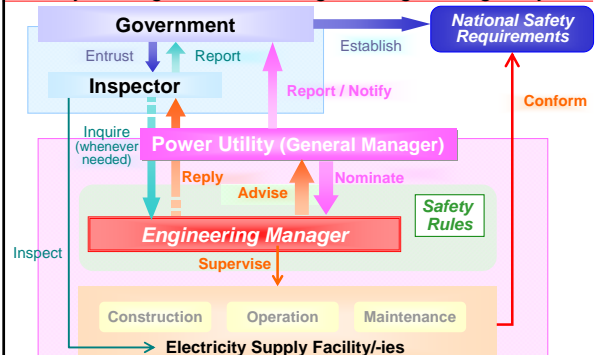
## V. Engineering Manager System

## Outline of *Engineering Manager* System

- Considering the diversification of players in the power sector of Indonesia, the responsibility for safety management of each electrical facility should be clarified
- The proposed *Engineering Manager* is obliged to supervise the safety of the electrical facility in conformity to *National Safety Requirements*



## Safety Management with *Engineering Manager* System



## Main Tasks of Engineering Manager

### Construction

1. Supervision on facility construction plan;
2. Assessing the conformity of construction designing to *National Safety Requirements*;
3. Site investigation during construction works;
4. Inspection before commissioning;

### Operation

1. Development of annual activity plan on safety management;
2. Supervision on submission of application / notification documents to the authority;
3. Supervision and assessment of safety rules and manuals;
4. Planning and implementation of safety education
5. Attendance at meetings related to safety management

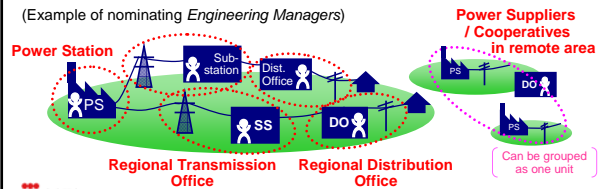
### Maintenance

1. Assessment of the condition of facilities in operation (site investigation)
2. Assessment of safety management
3. Supervision on the revision of site patrol policy
4. Measures against abnormalities and/or accidents/troubles
5. Cooperation with statutory inspection carried out by the Inspector

## Nomination of Engineering Manager

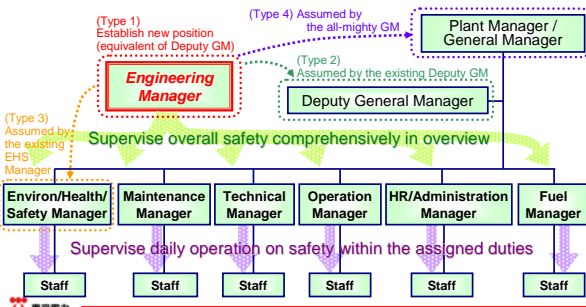
- One *Engineering Manager* must be nominated at the discretion of each power utility, e.g. one each at each Regional Business Unit (e.g. power station, regional transmission office, regional distribution office)
- The rule is applied universally regardless of the types of utilities (e.g. PLN, IPPs, power suppliers in remote islands, rural distribution cooperatives)
- Small utilities (e.g. power suppliers in island areas, rural distribution cooperatives) can be grouped as one Regional Business Unit to nominate an *Engineering Manager*  
[\* The *Engineering Manager* is not necessarily stationed onsite]

(Example of nominating *Engineering Managers*)



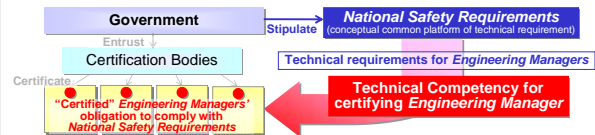
## Positioning of Engineering Manager

- Positioning of *Engineering Manager* in an organization will not be explicitly provided in regulations, and is up to each power utility's discretion taking into account its own organizational structure and staff capacity, such as...



## Certification of Engineering Managers

- The Government (via Certification Bodies) provides certification to *Engineering Manager*, based on the Competency Standard that is developed for confirming:
  - ✓ Their understanding of *National Safety Requirements*, the common platform of technical requirements
  - ✓ Their ability of developing *Safety Rules* for their own facilities, which must conform to *National Safety Requirements*
- *Engineering Manager* whose activities fail to comply with *National Safety Requirements* is penalized



## Recommended Action Plan (*Engineering Manager*)

- Legislation for introducing *Engineering Manager* System and promotion for full adoption
- MEMR is suggested to consider developing guidelines that present *Engineering Manager's* tasks and responsibilities as "sample reference" based on the JICA Study Team's proposal (each utility can develop variations to the sample)
- Gradual adoption of *Engineering Manager* System by prioritizing large-scale power stations (important in terms of impact on safety) may be considered, if full adoption to power suppliers in island areas and/or rural distribution cooperatives at once appears to be difficult
- Discussion on applying *Engineering Manager* System to power users' facilities and captive power needs to be considered as the next step after the completion of this Study

## VI. Technical Competency for Engineering Manager



## Types of Engineering Managers

Engineering Managers are classified in accordance with the types of electrical facilities, also considering the actual situation in Indonesia.

Hydropower  
(Civil Engineering) (Mechanical & Electrical)

Thermal power

Transmission & Substation

Distribution

31

## Required Competency for Engineering Managers

Certification bodies assess the applicants' competency with *exam (writing/verbal)* and *relevant work experience & academic background* and issue certifications for each type of facility

Engineering Mgr.	Competency Area			
	Construction	Operation	Maintenance	Technical knowledge
Hydro Power (Civil Engineering)	Facility Specific Competency for Civil Engineering			
Hydro Power (Mechanic. & Elec.)	Facility Specific Competency for Mech. & Elec.			
Thermal Power	Basic Competency	Facility Specific Competency for Thermal Power		
Transmission & Substation	Facility Specific Competency for Trans. & S/S			
Distribution	Facility Specific Competency for Distribution			

32

## Basic Competency of Engineering Managers

First step, i.e. "Basic Competency", to assess generally required competency regardless of the type of the facilities, followed by the second step, "Facility-specific competency" (see next slides)

- Knowledge of Power System
- Understanding of Facilities Condition and its Safety

- Supervision on Reporting
- Review and Assessment

- Understanding of Regulation
- Judgment Criteria
- Corporate Rules
- Organizational Structure

**Compliance with Safety Rules**

**Knowledge of Electricity**

**Reporting to Authorities**

- Construction & O&M Planning
- Safety Work Planning

**Planning of Construction O&M**

**Training of Staffs**

- Educational Programs
- Technical Training

33

## Facility-specific Competency (1)

### Hydropower (Civil Engineering)

1 <sup>st</sup> Category	2 <sup>nd</sup> Category	3 <sup>rd</sup> Category
Construction	Planning & Designing	Supervision on Planning Preliminary Survey Construction Planning Supervision on Design & Specification
	Construction Works	Subcontracting & Procurement Safety Management Evaluation Reporting Construction Supervision Field Inspection
Operation	Power Supply	Operation Planning Operation record Supervision on Operational Procedures Maintaining Stable Power Supply Supervision on operation
	Restoration of Facilities from Accidents	Initial Reporting Supervision on tentative restoration Final reporting Restoration Planning Restoration works
	Operational Management	Facility Management Safety Management Service Suspension Planning Training & Education
Maintenance	Field Inspection & Patrol	Supervision on Site Patrol Field Inspection Supervision on Patrol Planning Inspection Planning
	Repairing & Maintenance Works	Repairing Works Planning Subcontracting & Procurement Supervision on Repairing Works Evaluation of Test Results Investigation & Designing Safety Management Field Inspection

34

## Facility-specific Competency (2)

### Hydropower (Mechanical & Electrical)

1 <sup>st</sup> Category	2 <sup>nd</sup> Category	3 <sup>rd</sup> Category
Construction	Planning & Designing	Supervision on Planning Preliminary Survey Construction Planning Supervision on Design & Specification
	Construction Works	Subcontracting & Procurement Safety Management Evaluation Reporting Construction Supervision Field Inspection
Operation	Power Supply	Operation Planning Operation record Supervision on Operational Procedures Maintaining Stable Power Supply Supervision on operation
	Restoration of Facilities from Accidents	Initial Reporting Supervision on tentative restoration Final reporting Restoration Planning Restoration works
	Operational Management	Facility Management Safety Management Service Suspension Planning Training & Education
Maintenance	Field Inspection & Patrol	Supervision on Site Patrol Field Inspection Supervision on Patrol Planning Inspection Planning
	Repairing & Maintenance Works	Repairing Works Planning Subcontracting & Procurement Supervision on Repairing Works Evaluation of Test Results Investigation & Designing Safety Management Field Inspection

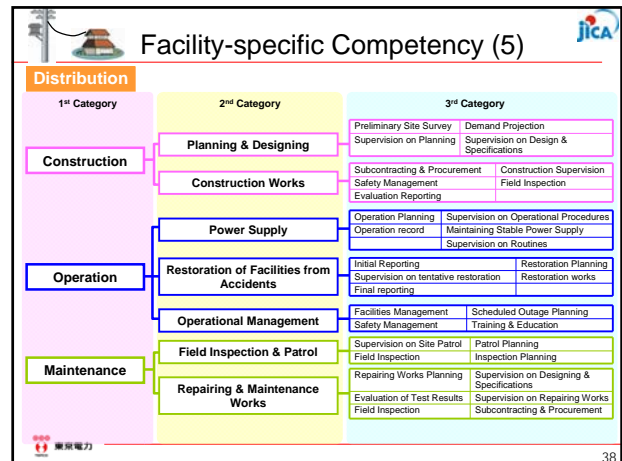
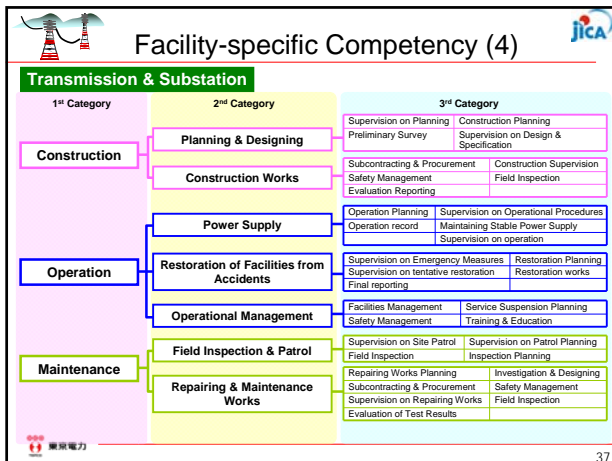
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## Facility-specific Competency (3)

### Thermal Power

1 <sup>st</sup> Category	2 <sup>nd</sup> Category	3 <sup>rd</sup> Category
Construction	Planning & Designing	Supervision on Planning Preliminary Survey Construction Planning Supervision on Design & Specification
	Construction Works	Subcontracting & Procurement Safety Management Evaluation Reporting Construction Supervision Field Inspection
Operation	Power Supply	Operation Planning Operation record Supervision on Operational Procedures Maintaining Stable Power Supply Supervision on operation
	Restoration of Facilities from Accidents	Initial Reporting Supervision on tentative restoration Final reporting Restoration Planning Restoration works
	Operational Management	Facility Management Safety Management Service Suspension Planning Training & Education
Maintenance	Field Inspection & Patrol	Supervision on Site Patrol Field Inspection Supervision on Patrol Planning Inspection Planning
	Repairing & Maintenance Works	Repairing Works Planning Subcontracting & Procurement Supervision on Repairing Works Evaluation of Test Results Investigation & Designing Safety Management Field Inspection

36



### Recommended Action Plan (Technical Competency)

- Based on the list of technical requirements for *Engineering Manager* provided by the JICA Study Team, MEMR staff, together with the Study Team, prepares "template" of Competency Units to be fit for the authorized format
- The JICA Study Team will continue providing MEMR with additional materials by the end of this Study so that MEMR can take over and complete the full set of Competency Units and take next steps such as authorizing competency units and institutionalizing certification & licensing scheme
- For implementing *Engineering Manager* System at ease, making transitional period of certification/licensing before full adoption may need to be considered, such as
  - issuing temporary certification/license without exams (only valid for the first few years) for applicant engineers who have good work experience in the respective fields

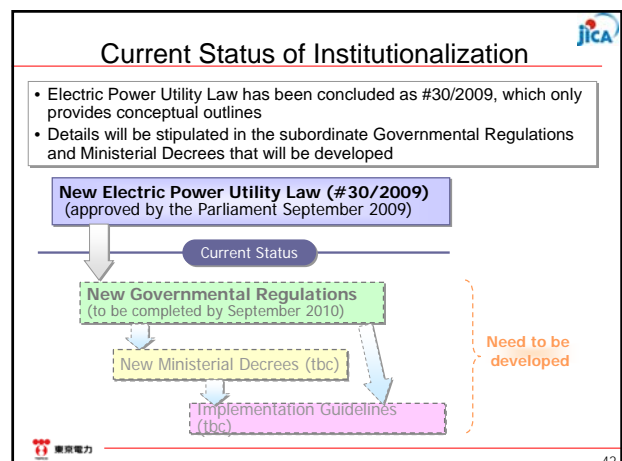
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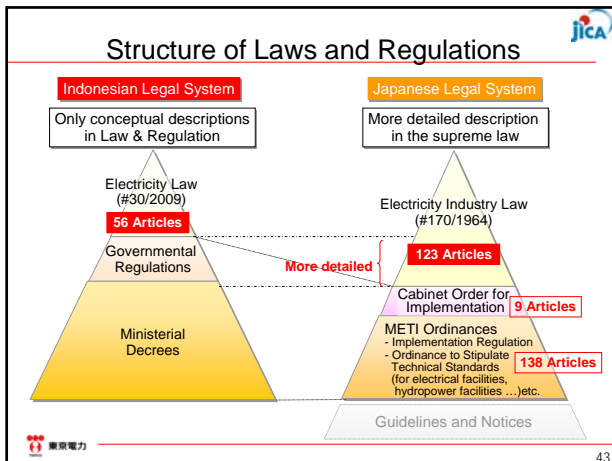
# Terima Kasih

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# Appendix

東京電力 41





### Structure of Laws and Regulations (cont'd)

- In general, Japanese Law has more detailed provisions than Indonesian Law, which is evidenced by the fact that Japanese Law consists of 123 Articles, more than twice of Indonesian Law
- For instance, regarding the safety of electrical facilities,
  - In Indonesian New Electric Power Utility Law, there's a simple stipulation, Article 44 (1): Every activity of electric power utility needs to be in conformity to Electricity Safety Regulations  
thus details are left to Governmental Regulations (and Ministerial Decrees) that are to be developed in a year
  - Japanese Electricity Industry Law provides more stipulations, such as
    - Article 39 - 41: Conformity to technical standards;
    - Articles 42: Establishment of Safety Rules;
    - Articles 43 - 45: Nomination of Chief Engineers;
 and detailed provision of facility inspection are also found in Articles 47 - 55

Provisions in Japanese Law can be the reference for developing Governmental Regulations and Ministerial Decrees in Indonesia

44

- ### [Japan's Case] Overview of Electricity Industry Law
- Chapter 1: General Provisions (Articles 1 - 2)
  - Chapter 2: Electricity Business (# 3 - 37)
  - Chapter 3: Electric Facilities (# 38 - 57)
    - Section 1: Definitions (# 38)
    - Section 2: Electric Facilities for Business Use (# 39 - 57)
      - Subsection 1: Conformity to Technical Standards (# 39 - 41)
      - Subsection 2: Autonomous Safety Management (# 42 - 45)
        - Subsection 2-2: Special Provisions on Environmental Impact Assessment (# 46)
        - Subsection 3: Construction Plan and Inspection (# 47 - 55(1))
        - Subsection 4: Succession (# 55(2))
      - Section 3: Electric Facilities for General Use (# 56 - 57)
    - Chapter 4: Use of Land (# 58 - 66)
    - Chapter 5: Registered Safety Management Examination Body, Designated Examining Body, and Registered Investigation Body (# 67 - 92)
    - Chapter 6: Organization to Support Electricity Transmission and Distribution
    - Chapter 7: Miscellaneous Provisions (# 93 - 99)
    - Chapter 8: Penalties (# 100 - 114)
    - Appendix Provisions (# 115 - 123)
- Provisions related to safety management
- 45

### [Japan's Case] Conformity to Safety Requirements

- The Japanese Law stipulates four main principles of "Technical Standards" (Safety Requirements) that a Power Utility needs to comply with, and their details are provided in Ministerial Ordinances

Article 39: A (power utility) shall maintain the facilities to ensure that they conform to the technical standards established by METI Ordinance

(2): The METI Ordinance in the preceding paragraph shall be formulated in accordance with the following:

- Electric Facilities for (power supply) shall not cause bodily harm nor inflict damage to objects
- Electric Facilities for (power supply) shall not cause electric nor magnetic interference with other electric equipment or objects
- Damage to Electric Facilities for (power supply) shall not significantly hinder the supply of electricity by an (electricity power utility)
- Where Electric Facilities for (power supply) are used by an (electricity power utility), damage to the Electric Facilities for (power supply) shall not significantly hinder the supply of electricity pertaining to the (electricity power utility)

46

- ### [Japan's Case] Establishment of Safety Rules
- Each power utility is obliged to establish Safety Rules, and to notify to the Government before commencement of using electric facilities in order to ensure safety in construction, operation, and maintenance of these facilities
  - The Government can order the power utility to revise Safety Rules when it is necessary for ensure safety
- Article 42: A (power utility) shall, in order to ensure safety of the construction, maintenance and operation of the Electric Facilities (...), establish Safety Rules for each organization in charge of the Electric Facilities for (power utility) the safety of which should be secured uniformly, and notify the Minister of Economy, Trade and Industry of the rules before the commencement of the use of the Electric Facilities for (power utility) by the organization (in the case of facilities requiring self-inspection (...), before the commencement of the construction of the facilities).
- (2): The Minister (...), when he/she finds it necessary in order to ensure safety of the construction, maintenance, and operation of Electric Facilities (...), orders (...) to revise the Safety Rules
- 47

- ### [Japan's Case] Nomination of Engineering Manager
- Each power utility is obliged to nominate at least one licensed Chief Engineer and to notify the Government of the nomination.
  - Chief Engineers are responsible for supervising the safety of the construction, maintenance, and operation of facilities
- Article 43: A (power utility) shall (...), appoint one or more chief engineers from among persons who have a chief engineer's license in order to cause him/her to supervise the safety of the construction, maintenance, and operation of the facilities.
- (2): ...
- (3): A (power utility) shall, when having appointed a chief engineer (...), notify the Minister of Economy, Trade and Industry to that effect without delay. The same shall apply when such person has dismissed the chief engineer.
- (4): The chief engineer shall perform the duty of supervising the safety of the construction, maintenance, and operation (...) in good faith.
- (5): People who are engaged in the construction, maintenance or operation of Electric Facilities (...) shall follow the instructions given by the chief engineer to ensure the safety thereof.
- 48

### [Japan's Case] Construction Plan and Inspection

- Especially important facilities in terms of safety need to gain approval on the plan and to pass Government's inspection
- Notification of the construction plan and carrying out self-inspection are needed for facilities that are important next to the aforementioned

Article 47: A person who intends to (...) install or modify **Electric Facilities** (...) specified by an Ordinance of METI as being particularly important for assuring public safety, shall obtain approval of the plans (...) from the Minister of Economy, Trade and Industry (...)

Article 49: Electric Facilities (...) to be installed or modified according to a construction plan approved under Article 47 (...) shall not be used unless and until they undergo and pass an inspection conducted by the Minister of Economy, Trade and Industry

Article 48: A person who intends to (...) to install or modify **Electric Facilities** (...) specified by an Ordinance of METI, shall notify the Minister (...) of the plan of the construction project.

Artcl. 50-2: A person (...) pursuant to Article 48 (...) shall **conduct a self-inspection of the Electric Facilities** (...) before commencing the use thereof, record the inspection results, and preserve such records (...)

東京電力 JICA 49

### Application in Indonesian Legal Structure

- Considering the nature of legal structure in Indonesia, description of National Safety Requirements, Safety Rules and Engineering Manager system may be better still conceptual, and details will be provided in the subordinate Ministerial Decree and/or Implementation Guidelines (tbc)

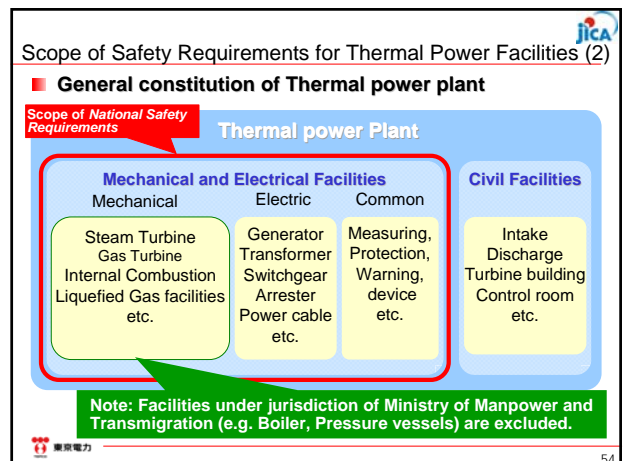
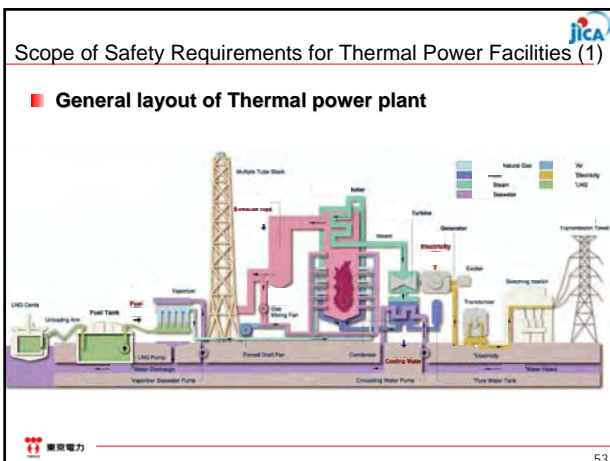
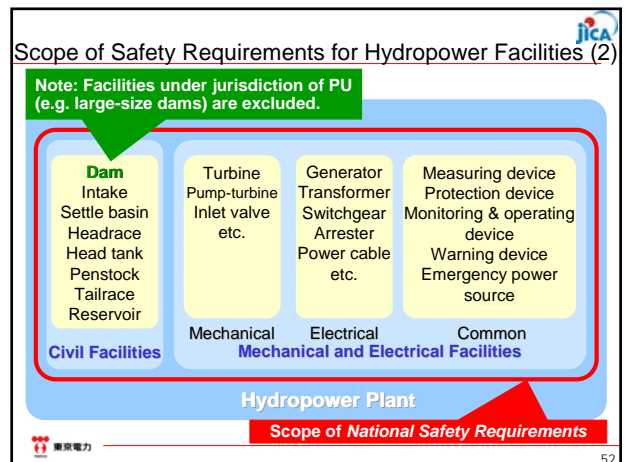
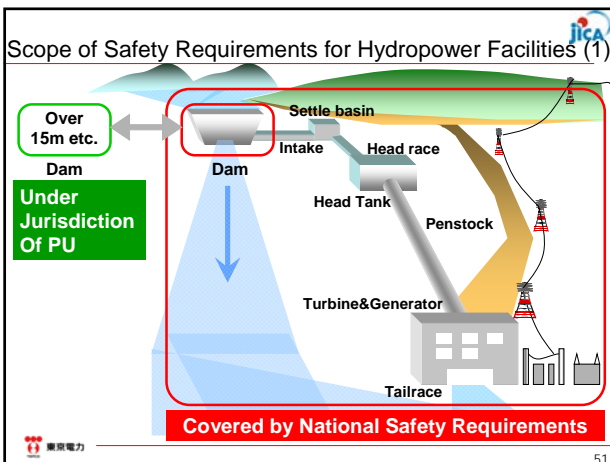
Electric Power Utility Law Article 44 (1): Every activity of electric power utility needs to be in conformity to Electricity Safety Regulations

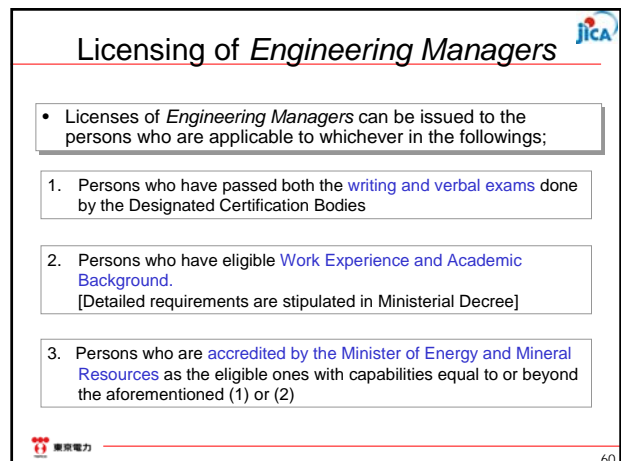
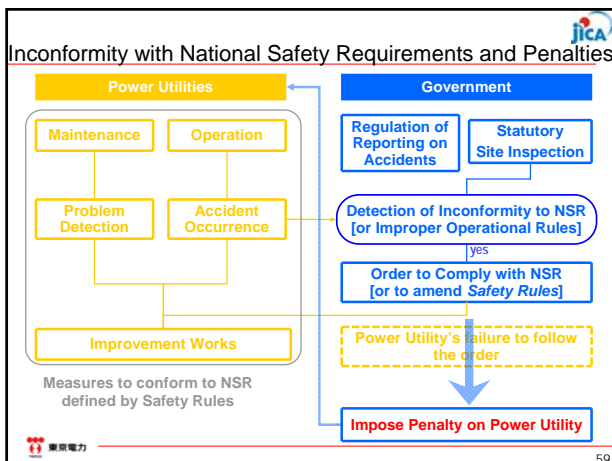
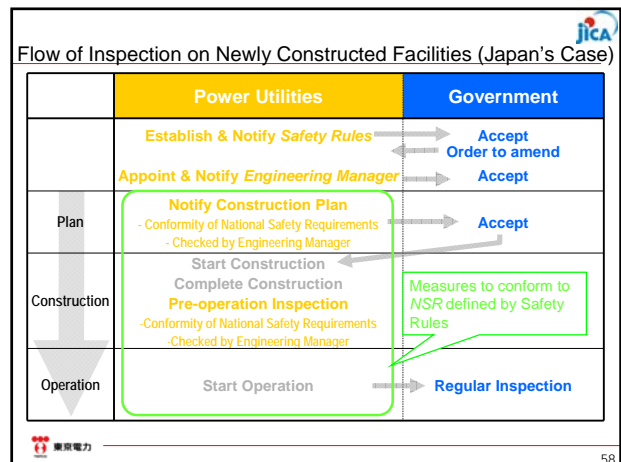
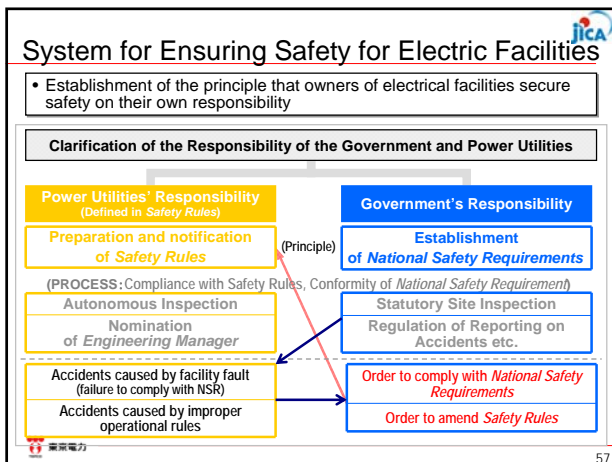
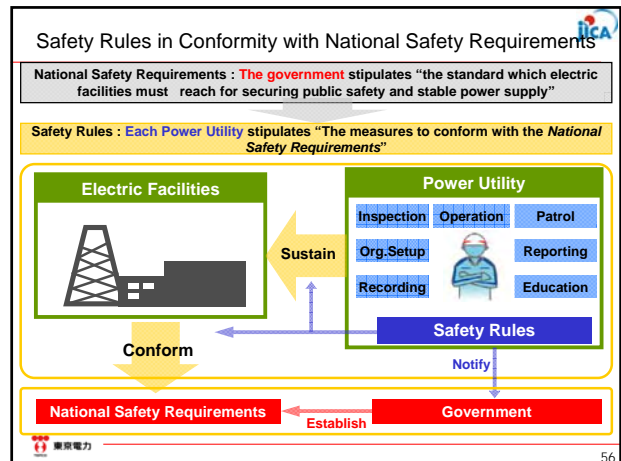
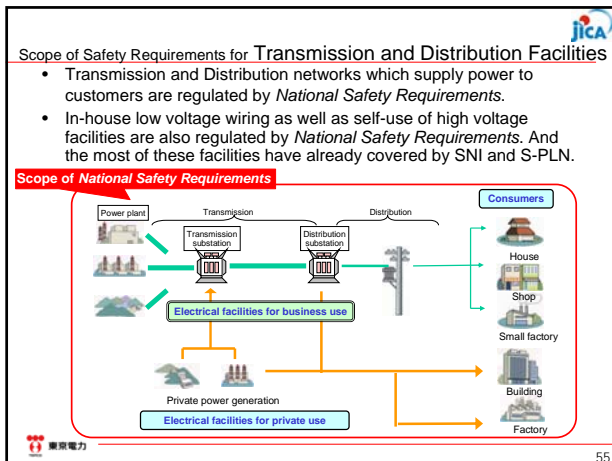
Governmental Regulations: Every facility needs to conform to the following safety requirements... (more detailed descriptions) → **National Safety Requirements**

Ministerial Decrees / Implementation Guidelines: The owner of facilities needs to develop rules on safety management! (more detailed descriptions) → **Safety Rules**

Ministerial Decrees / Implementation Guidelines: Every utility is obliged to assign a person responsible for safety (more detailed descriptions) → **Engineering Manager**

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## 1.5 5<sup>th</sup> Seminar (January 27, 2010)

**SUSUNAN ACARA SEMINAR KE - 5**  
**“DEVELOPMENT OF TECHNICAL STANDARDS AND COMPETENCY STANDARDS IN**  
**ELECTRICAL POWER SECTOR IN INDONESIA”**

Rabu, 27 January 2010

Waktu	Acara	Pelaksana
08.30 – 09.00	Pendaftaran peserta	Panitia
09.00 – 09.20	Pembukaan : a. Sambutan dari Embassy of Japan  b. Sambutan dari JICA Indonesia Office  c. Sambutan dan Pembukaan oleh Direktur Jenderal Listrik dan Pemanfaatan Energi	Mr. Takehiro Tsuchiya <i>Secretary</i> <i>Embassy of Japan</i>  Mr. Hiroyuki Kawanishi <i>Senior Representative</i> <i>JICA Inodonesia Office</i>  Ir. Johnni R.H. Simanjuntak Direktur Teknik dan Lingkungan Ketenagalistrikan, DESDM
09. 20 – 09. 40	Coffee break	Panitia
09. 40 – 11.50	Presentasi & QA : 1. <i>Overview of the JICA Study Team's Proposal</i> 2. <i>Answers to Frequently Asked Questions (FAQs) about the JICA Study Team's proposal</i> ✓ <i>National Safety Requirements</i> ✓ <i>Safety Rules</i> ✓ <i>Engineering Manager System</i> ✓ <i>Technical Competency for Engineering Manager</i> 3. <i>Action Plan for MEMR after the completion of the Study</i>	<i>JICA Study Team</i>  Moderator : Ir. Arief Indarto, MM. Ditjen Listrik dan Pemanfaatan Energi DESDM
11.50 – 12.00	Penutupan	Mr. Yoshikazu Wada <i>Assistant Director</i> <i>Industrial Development Department</i> <i>JICA Head Office</i>
12.00 – selesai	Makan Siang	Panitia



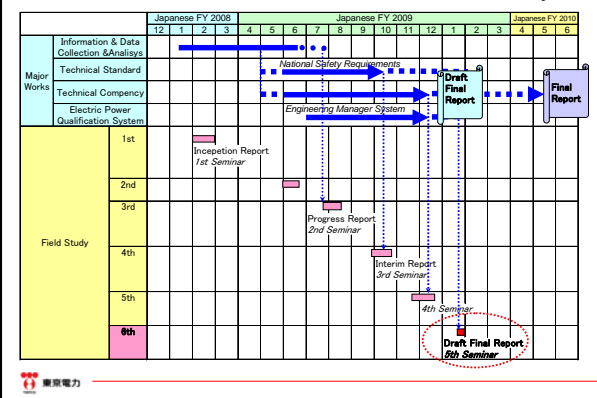
# The Study on Development of Technical Standards and Competency Standards in Electrical Power Sector in Indonesia

- Presentation for the 5<sup>th</sup> Seminar -

27<sup>th</sup> January 2010  
JICA Study Team



## Overall Work Plan and the 6<sup>th</sup> Field Study



## Objectives of Today's Seminar

- Today's seminar is the 5<sup>th</sup> and the **final seminar of this JICA Study**
- Therefore, today's seminar does not aim at proposing something new besides what have been presented in the preceding 4 seminars, but focuses on
  - **Summarizing what the JICA Study Team has proposed to Indonesian stakeholders**; and
  - **Answering to the Frequently Asked Questions (FAQs)** that have been made by Indonesian stakeholders in the past;
- In addition, the JICA Study Team would like to present **what actions the Indonesian counterparts (MEMR) are expected to take after the completion of this Study**, i.e. from now on [please be noted that the "Action Plan" that is presented today is tentative and more discussion for brush-up is needed]



## Table of Contents

- I. Overview of the JICA Study Team's proposal
- II. Answers to Frequently Asked Questions (FAQs) about the JICA Study Team's proposal
  - Also refer to the handbook "Buku Pegangan tentang Peningkatan Keselamatan Instalasi Tenaga Listrik"
- III. Action Plan for MEMR after the completion of the Study



## I. Overview of the JICA Study Team's proposal



## The JICA Study Team's Proposal

- The JICA Study Team has so far proposed 3 main pillars for securing safety based on the experience in Japan, i.e. *National Safety Requirements*, *Safety Rules*, and *Engineering Manager* system;
  - The JICA Study Team expects that these proposals are taken into account in developing new Regulations and Decrees
- National Safety Requirements

Safety Rules

Engineering Manager

: Conceptual common platform of technical requirements for securing safety of electrical facilities

: Operational principles that each Power Utility must comply with

: Nomination of a qualified person who supervises the overall safety

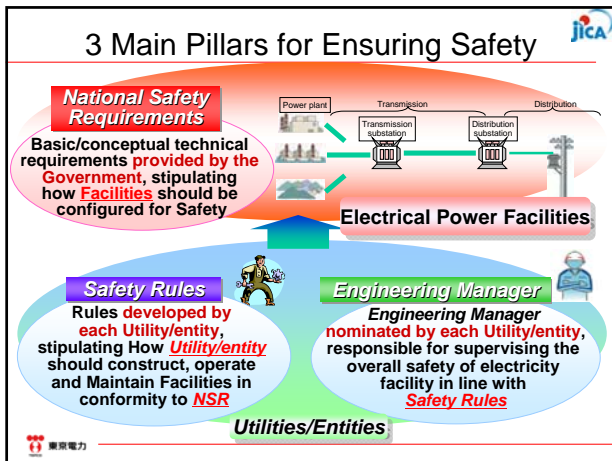
: Improving technical competency of engineers through certification

← Institutional Framework for Securing Safety

← Capacity Development

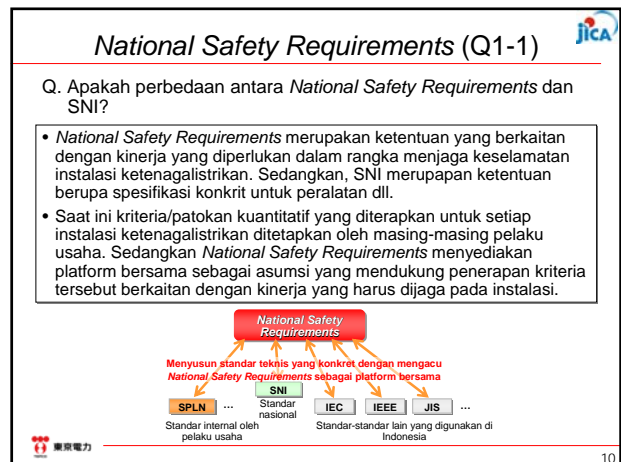
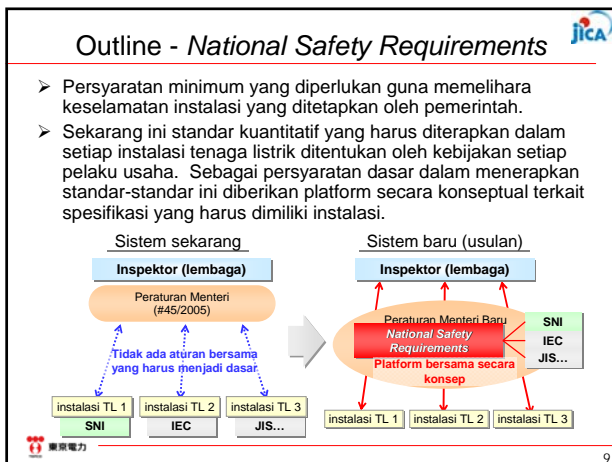






## II. Answers to Frequently Asked Questions (FAQs) about the JICA Study Team's proposal

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### National Safety Requirements (Q1-2)

Q. Apakah National Safety Requirements ini merupakan aturan wajib sesuai peraturan menteri dll, ataukah aturan sukarela?

- National Safety Requirements diusulkan sebagai aturan wajib.
- Pasal 44 ayat (5) UU No.30/2009 mengatur kewajiban pemenuhan SNI untuk peralatan dan pemanfaat tenaga listrik. Namun SNI hanya menetapkan spesifikasi peralatan secara konkret tetapi tidak menetapkan pemikiran yang melatarbelakangi ketentuan tersebut secara konseptual bagaimana seharusnya instalasi dipasang dan dipelihara dalam rangka menjaga keselamatan penyediaan tenaga listrik.
- National Safety Requirements menetapkan kinerja yang harus dipelihara pada instalasi. Standar teknis seperti SNI, standar internasional dll diacu atau disusun dengan prasyarat mengikuti National Safety Requirements ini.

### National Safety Requirements (Q1-3)

Q. Apakah National Safety Requirements ini merupakan aturan wajib sesuai peraturan menteri dll, ataukah aturan sukarela?

- Spesifikasi detail untuk instalasi yang sudah ada tetap mengacu pada standar yang sudah ada seperti SNI.
- Namun dalam hal pemasangan instalasi baru dan apabila standar teknis yang diacu dianggap ada bagian yang tidak memenuhi persyaratan konseptual sebagaimana diatur pada National Safety Requirements sepenuhnya, maka DESDM dapat memberi suatu pengarah.
- National Safety Requirements merupakan ketentuan persyaratan kinerja yang dibutuhkan pada instalasi. Pada prinsipnya sesuai dengan standar teknis yang sudah ada.

## National Safety Requirements (Q1-4)



Q. Apakah *National Safety Requirements* tidak menetapkan instalasi pembangkit listrik tenaga nuklir sebagai obyeknya?

- Tidak termasuk instalasi PLTN. Alasannya:
  1. Instalasi pembangkit tenaga listrik tenaga nuklir memerlukan persyaratan teknis yang canggih dan khusus dibandingkan instalasi pembangkit listrik lainnya sehingga di Jepang pun dibuat persyaratan teknis secara khusus/terpisah yang berbeda dengan instalasi pembangkit listrik lainnya.
  2. Saat ini di Indonesia tidak ada instalasi pembangkit listrik tenaga nuklir secara komersial. Kewenangan yang terkait dengan pengembangan teknologi tenaga nuklir dan penataan aturan hukum ada pada BATAN dan BAPETEN, bukan DESDM.

## National Safety Requirements (Q1-5)



Q. Apakah *National Safety Requirements* tidak menetapkan energi terbarukan, seperti instalasi pembangkit listrik panas bumi, angin, dan tenaga surya, dll sebagai obyeknya?

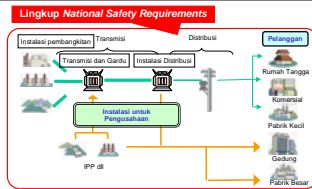
- Instalasi yang terkait dengan energi yang terbarukan belum dimasukkan ke dalam *National Safety Requirements* karena spesifikasi teknis untuk masing-masing instalasi masih berbeda secara signifikan dan peraturan mendasar yang harus diacu oleh seluruh instalasi tersebut masih sedikit.
- Meskipun demikian, persyaratan umum tenaga listrik yang terkait dengan seluruh instalasi pembangkit listrik tercakup dalam *National Safety Requirements*. Selain itu, instalasi yang terkait langsung dengan pembangkit listrik panas bumi, kecuali bagian sumur uap, pada prinsipnya sama dengan pembangkit listrik tenaga uap sehingga diacu pada aturan untuk pembangkit listrik tenaga uap.

## National Safety Requirements (Q1-6)



Q. Apakah *National Safety Requirements* tidak menetapkan instalasi bertegangan menengah ke atas dan instalasi pemanfaatan bertegangan rendah menjadi obyek?

- Instalasi bertegangan menengah ke atas dan instalasi pemanfaatan bertegangan rendah menjadi obyek.
- *National Safety Requirements* meliputi semua instalasi ketenagalistrikan, khususnya pada ketentuan instalasi penyaluran (Bagian II, Bab 1).

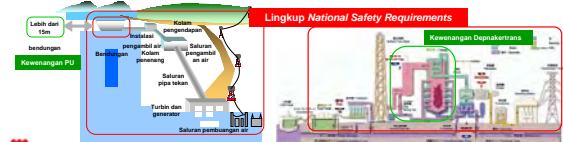


## National Safety Requirements (Q1-7)



Q. Apakah instalasi (seperti pengelasan, bendungan besar, dll), yang diawasi lembaga pemerintah selain DESDM, tidak menjadi obyek dalam *National Safety Requirements*?

- Bendungan besar, pengelasan dll tidak termasuk. Alasannya:
  1. Menghindari terjadinya aturan yang tumpang tindih untuk obyek yang sudah diatur bidang keselamatan oleh instansi lain misalnya bendungan besar (PU), pengelasan (Depnakertrans).
  2. Namun instalasi boiler yang berkaitan dengan pembangkitan dilakukan pengawasan oleh DESDM dan Depnakertrans, maka termasuk pada lingkup *National Safety Requirements*.



## National Safety Requirements (Q1-8)



Q. Dalam *National Safety Requirements* hanya sedikit ketentuan secara kuantitatif. Bukankah hal ini belum sempurna sebagai standar teknis?

- *National Safety Requirements* merupakan persyaratan (platform bersama) yang berkaitan dengan spesifikasi yang harus dipelihara pada instalasi ketenagalistrikan yang diatur oleh pemerintah. Oleh karena itu, persyaratan fungsional yang tidak mengandung angka secara kongkrit.
- SNI atau standar internasional seperti IEC mengatur spesifikasi detail termasuk angka kongkrit yang dapat digunakan sebagai patokan. (Lihat hubungan dengan *National Safety Requirements* di bawah ini)



## Penjelasan aturan di Jepang (1)



• NSR merupakan persyaratan teknis secara konseptual. "Penjelasan aturan di Jepang" merupakan contoh konkret yang dijabarkan dari persyaratan teknis yang dituntut NSR berupa nilai/angka, rumus dll.

### Pasal 21 NSR Pencegahan Memasuki Gardu Induk, dll selain Operator

- Pada gardu induk, gardu hubung atau tempat yang dipersamakan yang dipasang peralatan elektromekanik bertegangan menengah, tinggi, atau ekstra tinggi, saluran bus dll, harus dilakukan tindakan yang tepat sekaligus menunjukkan bahaya yang ada pada peralatan elektromekanik, bus, dll agar selain operator tidak mudah masuk ke dalam area tersebut.

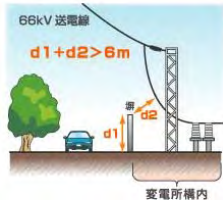
### Pasal 43 Penjelasan aturan di Jepang

1. Pada gardu induk, gardu hubung atau tempat yang dipersamakan yang dipasang peralatan elektromekanik bertegangan menengah, tinggi, atau ekstra tinggi, saluran bus dll, harus lakukan tindakan yang tepat agar selain operator tidak mudah masuk ke dalam area tersebut yaitu:
  - 1) Memasang pagar, tembok dll
  - 2) Memasang petunjuk larangan memasuki areal tersebut di depan pintu
  - 3) Memasang kunci atau peralatan lain yang tepat di depan pintu
2. Apabila pagar, tembok dll sebagaimana diatur pada ayat 1 berdekatan dengan bagian aktif tegangan ekstra tinggi. Penjumlahan ketinggian pagar, dinding, dll di sekitar lokasi yang sejenis gardu induk, dll, dengan jarak dari pagar, dinding, dll hingga bagian aktif tegangan ekstra tinggi berada di atas nilai yang ditetapkan sebagaimana tabel 43-1 sesuai dengan kategori tegangan
  - 1) Memasang pagar, tembok dll
  - 2) Memasang petunjuk larangan memasuki areal tersebut di depan pintu
  - 3) Memasang kunci atau peralatan lain yang tepat di depan pintu
3. dst

## Penjelasan aturan di Jepang (2)

Tabel 43-1

Kategori tegangan	Penjumlahan ketinggian pagar, dinding, dll di sekitar lokasi yang sejenis gardu induk, dll, dengan jarak dari pagar, dinding, dll
35,000V atau lebih kecil	5m
35,000V s/d 160,000V	6m
Lebih dari 160,000V	6m ditambah 12cm untuk setiap kelipatan 10,000V



## National Safety Requirements (Q1-9)

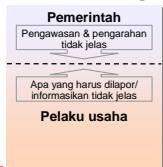
Q. Apakah dalam *National Safety Requirements* tidak dipertimbangkan keselamatan terkait gempa bumi?

- Dalam *National Safety Requirements* dipertimbangkan pula penanganan untuk gempa bumi. Misalnya konstruksi aman yang mempertimbangkan kekuatan gempa bumi (Pasal 60) untuk kekuatan beban bendungan, dll.
- Namun demikian, metode perhitungan beban secara kongkrit ditetapkan dalam standar detil aturan penjabarannya.

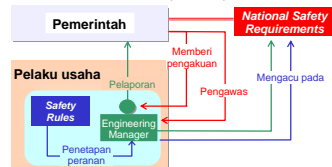
## Outline - Safety Rules

- Agar menjamin dilaksanakannya tugas harian untuk memelihara spesifikasi instalasi yang telah ditetapkan dalam *National Safety Requirements*, maka pengusaha menetapkan kebijakan dasar terkait operasional instalasi sebagai *Safety Rules*, serta diwajibkan memberikannya pada pemerintah.
- Pelaku usaha menetapkan dan melaksanakan dokumen internal seperti manual tugas lebih detil, dll berdasarkan *Safety Rules*

Sistem sekarang



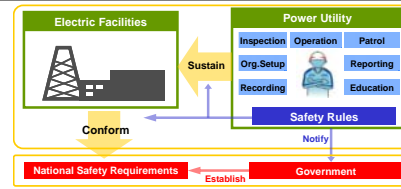
Sistem baru (usulan)



## Safety Rules (Q2-1)

Q. Bagaimanakah perbedaan antara *National Safety Requirements* dengan *Safety Rules*?

- *National Safety Requirements* merupakan ketentuan bagaimana seharusnya kondisi instalasi dalam rangka menjaga keselamatan penyediaan tenaga listrik.
- Sedangkan *Safety Rules* lebih berfokus pada kegiatan yang dilakukan oleh "manusia" apa yang harus dilakukan sehari-hari dalam rangka mencapai dan menjaga kondisi instalasi.



## Safety Rules (Q2-2)

Q. Siapa yang menyusun *Safety Rules*

- *National Safety Requirements* ditetapkan pemerintah (DESDM), sedangkan *Safety Rules* pada prinsipnya ditetapkan oleh pelaku usaha.

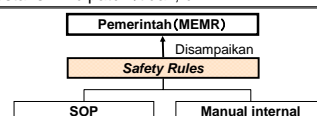
Alasannya:

1. *Safety Rules* merupakan aturan dasar yang harus diikuti oleh pelaku usaha dalam konstruksi, operasi dan pemeliharaan yang bukannya diatur secara seragam oleh pemerintah harus disusun sesuai dengan instalasi yang dimiliki dan metode yang digunakan oleh masing-masing pelaku usaha. Yang lebih rasional adalah setiap pelaku usaha yang memiliki instalasi berbeda yang menyusun masing-masing aturan dan disampaikan kepada pemerintah.
2. PLN, IPP skala besar sudah menyusun aturan internal dan manual operasional untuk instalasi yang dimiliki. Pengalaman tersebut dapat dimanfaatkan dalam penyusunan *Safety Rules* bagi setiap pelaku usaha.
3. Kebijakan pokok yang berkaitan dengan organisasi dan kelembagaan serta tugas di bidang keselamatan instalasi perlu disesuaikan dengan perkembangan teknologi, perubahan iklim usaha dll. Oleh karena itu *Safety Rules* sebaiknya disusun oleh pelaku usaha.

## Safety Rules (Q2-3)

Q. Pemerintah menuntun pembuatan SOP sebagai kebijakan dasar pelaksanaan tugas. Bagaimanakah perbedaannya dengan *Safety Rules*?

- SOP (Standard Operation Procedure) merupakan prosedur operasional secara mendasar dalam tugas-tugas setiap bidang industri yang diatur Depnakertrans.
- Sedangkan *Safety Rules* menetapkan prinsip dasar tentang organisasi dan tanggungjawab serta tugas-tugas harian dalam dimensi konseptual yang merupakan deklarasi kepatuhan. Berbeda dengan SOP, substansi yang dideklarasikan di sini dievaluasi oleh DESDM apakah sesuai atau tidak dari sisi manajemen keselamatan, serta apakah substansi ini dipatuhi/tidak, dll.



## Safety Rules (Q2-4)



Q. Terlepas dari pembuatan manual operasional tugas secara mandiri oleh pelaku usaha, apakah pelaku usaha dituntut untuk membuat dan melaporkan *Safety Rules*?

• Ya. Alasannya:

1. Manual operasional tugas yang dibuat secara mandiri oleh pelaku usaha merupakan dokumen pribadi milik setiap pelaku usaha dan tidak dikenai peraturan DESDM secara langsung.
2. *Safety Rules* menunjukkan dipatuhinya prinsip dan dilaksanakannya tugas yang terkait dengan keselamatan instalasi dengan melaporkan hal-hal yang sesuai dengan kebijakan dasar dan rangkuman manual operasional tugas ini kepada DESDM.
3. Manual operasional yang sudah ada dapat dimanfaatkan dalam penyusunan *Safety Rules*.

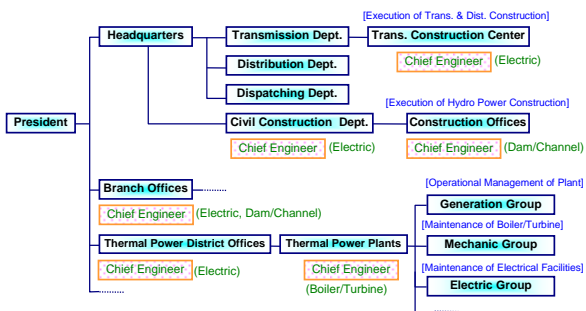
## Safety Rules (Q2-5)



Q. Apa sajakah hal-hal yang harus dimasukkan dalam *Safety Rules*?

- Secara garis besar terdiri dari 2 hal yaitu sistem organisasi guna memelihara keselamatan instalasi (terutama penempatan *Engineering Manager*, dll, klarifikasi pembagian tanggung jawab) serta kebijakan dasar tugas harian seperti teknik dan frekuensi pelaksanaan patroli, dll.
- Secara kongkrit sebagai berikut (usulan saat ini, detail sedang terus dipertimbangkan):
  - ✓ Sistem organisasi dan tanggung jawab untuk memelihara keselamatan instalasi
    - 1.1. Sistem organisasi pelaku usaha
    - 1.2. Tugas *Engineering Manager* dan posisinya dalam organisasi
    - 1.3. Kewenangan tugas setiap staf yang terkait dengan keselamatan instalasi
    - 1.4. Pelaksanaan diklat keselamatan bagi pekerja
  - ✓ Prinsip dasar terkait tugas keselamatan instalasi
    - 2.1. Konstruksi, operasi, dan pemeliharaan instalasi penyediaan tenaga listrik
    - 2.2. Inspeksi instalasi penyediaan tenaga listrik
    - 2.3. Pencatatan terkait keselamatan instalasi penyediaan tenaga listrik
    - 2.4. Laporan berkala dan laporan kecelakaan terkait instalasi tenaga listrik

## <Appendix> Example of Organization Chart

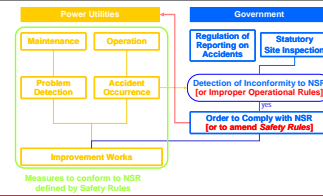


## Safety Rules (Q2-6)



Q. Perintah perbaikan *Safety Rules* dari pemerintah kepada pelaku usaha dimungkinkan. Perintah seperti apakah ini?

- Pada dasarnya dihargai aturan yang ditetapkan secara mandiri oleh pelaku usaha karena aturan tersebut dianggap telah dipertimbangkan cukup untuk menjamin keselamatan instalasi.
- Namun demikian, apabila sering terjadi kecelakaan dan masalah terjadi pada pelaku usaha tersebut, instruksi akan dikeluarkan oleh DESDM agar meningkatkan frekuensi dan substansi inspeksi instalasi serta meningkatkan jumlah penempatan *Engineering Manager*.



## Safety Rules (Q2-7)



Q. Dalam *Safety Rules* ditetapkan materi laporan kepada pemerintah terkait kecelakaan, dll. Apakah yang dilaporkan secara kongkritnya?

• Saat ini tidak ada ketentuan yang berkaitan dengan materi laporan. Oleh karena itu hal tersebut akan diatur didalam *Safety Rules*. Materi pelaporannya seperti berikut:

[Obyek yang harus dilaporkan]

- Luka atau kematian akibat sengatan listrik
- Kebakaran akibat listrik
- Kerusakan instalasi penyediaan tenaga listrik utama
- Kecelakaan besar seperti pemadaman luas dll

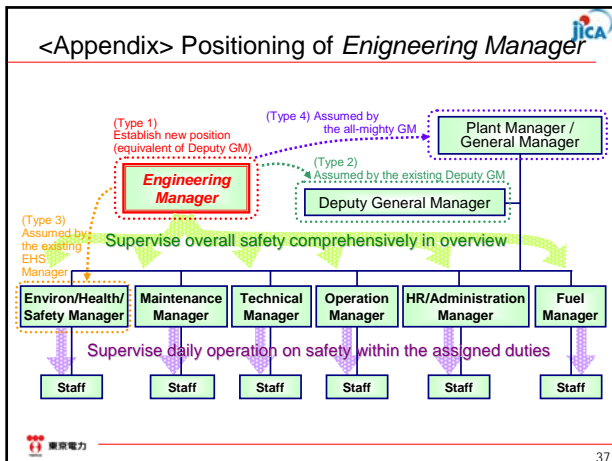
[Cara pelaporan]

- Pelaporan kecelakaan (laporan kilat) sesegera mungkin setelah kejadian dengan laporan yang detail
- Pelaporan berkala: Hasil akumulasi/klasifikasi kejadian dalam periode tertentu

## <Appendix> Reporting to the Government







### Engineering Manager System (Q3-6)

Q. Ada pelaku usaha yang telah menempatkan manajer penanggung jawab keselamatan. Apakah ini berarti perintah untuk menetapkan posisi sebagai *Engineering Manager* baru sebagai tambahan?

- Apabila telah menempatkan manajer yang setara *Engineering Manager*, tidak perlu menempatkan lagi *Engineering Manager* baru.
- Namun demikian, pihak yang ditugaskan dalam posisi ini diharuskan memiliki sertifikasi nasional yang sesuai dan melaksanakan tugas yang diatur UU.

38

### Engineering Manager System (Q3-7)

Q. Seberapa besarnya ruang lingkup tanggung jawab atau instalasi yang ditangani seorang *Engineering Manager*? Sebaiknya berapa orang *Engineering Manager* harus ditempatkan dalam 1 unit usaha?

- Metode penempatan tidak ditetapkan UU tetapi diatur oleh pelaku usaha dalam *Safety Rules*.
- Dalam metode penempatan *Engineering Manager*, dalam batas tertentu diserahkan pada kebijakan pelaku usaha itu sendiri, namun harus jelas tertulis dalam *Safety Rules* bagaimanakah penempatannya, dan sejauh mana ruang lingkup tugasnya.
- Bila DESDM menilai bahwa metode penempatan *Engineering Manager* tidak sesuai dengan ketentuan dalam *Safety Rules*, bisa menginstruksikan untuk merevisi *Safety Rules*.
- Sebagai patokan satuan unit usaha regional dimana seorang *Engineering Manager* ditempatkan, seperti 1 titik pembangkit (memungkinkan beberapa titik pembangkit dijadikan satu lingkup dalam hal beberapa pembangkit sejenis terdapat di titik-titik berdekatan), unit usaha transmisi dan gardu atau distribusi di tingkat propinsi.

39

### Engineering Manager System (Q3-8)

Q. Bila menempatkan *Engineering Manager* dalam suatu koperasi penyedia tenaga listrik skala kecil, bukankah sulit menyediakan SDM yang dapat menanganinya?

- Bisa ditangani dengan membuat kontrak kerja dengan pihak luar yang memiliki sertifikasi sebagai *Engineering Manager*.
- Jadi, seorang *Engineering Manager* bisa pula menangani beberapa tempat tempat terikat kontrak dengan beberapa kelompok penyedia tenaga listrik dan pelaku usaha beda pula, serta pelaku usaha skala kecil di pulau luar.

Example of Nominating Engineering Manager

Power Station

Sub station

Dist Office

Regional Transmission Office

Regional Distribution Office

Power Suppliers / Cooperatives in remote area

Can be grouped as one unit

40

### Engineering Manager System (Q3-9)

Q. Bila terjadi kecelakaan akibat kelalaian tugas *Engineering Manager*, atau setelah diinvestigasi ditemukan adanya hal tersebut, apakah akan diberlakukan sanksi?

- Bila DESDM menilai adanya masalah dalam pelaksanaan tugas yang diberikan kepada *Engineering Manager*, diberlakukan sanksi berupa pencabutan sertifikat *Engineering Manager*.
- Pelaku usaha yang telah menugaskan *Engineering Manager* tersebut harus menugaskan *Engineering Manager* baru sebagai penggantinya.

41

### Engineering Manager System (Q3-10)

Q. Bagaimanakah menentukan honor bagi pihak yang telah ditugaskan sebagai *Engineering Manager*?

- Standar honor bagi *Engineering Manager* ditetapkan sesuai kebijakan pelaku usaha yang menugaskannya dan tidak diatur dalam regulasi secara khusus.

42

**Outline - Standar kompetensi untuk *Engineering Manager***

- Dalam melaporkan penugasan *Engineering Manager* kepada pemerintah, pelaku usaha dituntut untuk menunjukkan kepemilikan sertifikasi kompetensi tertentu yang telah diterbitkan oleh lembaga sertifikasi yang ditunjuk pemerintah.
- Dalam hal ini, standar kompetensi teknis untuk sertifikasi *Engineering Manager* disiapkan oleh pemerintah. Standar ini tersistem dan berfokus pada penilaian terhadap pelaksanaan tugas-tugas pengawasan yang diperlukan guna memelihara keselamatan instalasi sebagaimana ditetapkan dalam *National Safety Requirements*.
- Lembaga sertifikasi yang ditunjuk oleh pemerintah menyiapkan sistem sertifikasi kompetensi berdasarkan standar ini.

```

    graph TD
      Pemerintah --> NSR[National Safety Requirements]
      NSR --> LSP[Lembaga sertifikasi profesi]
      LSP --> PEMU[Penugasan Engineering Manager oleh setiap pelaku usaha/unit usaha]
      NSR --> SKEM[Standar kompetensi untuk sertifikasi Engineering Manager]
      SKEM --> LSP
  
```

Logo: 東京電力

**Standar kompetensi untuk *Engineering Manager* (Q4-1)**

Q. Selain standar kompetensi untuk *Engineering Manager* yang diusulkan kali ini, apakah standar kompetensi untuk manajer lain (Operation Manager, Maintenance Manager etc.) tidak ditentukan?

- Tidak. Alasannya:
  1. Proyek JICA kali ini akan menetapkan syarat kompetensi yang diperlukan oleh pihak yang terkait dengan tugas tersebut dengan mengusulkan pembuatan *Engineering Manager* System untuk memastikan posisi tanggung jawab terkait keselamatan instalasi.
  2. Namun standar kompetensi *Engineering Manager* yang telah diusulkan kali ini dapat dijadikan acuan atau dasar dalam penyusunan standar kompetensi untuk manager umum lainnya.

Logo: 東京電力

**Standar kompetensi untuk *Engineering Manager* (Q4-2)**

Q. Apakah standar kompetensi untuk inspektor pemerintah ditetapkan?

- Tidak. Alasannya:
  1. Sebagaimana Q1, dalam proyek JICA kali ini masalah penetapan standar kompetensi untuk inspektor tidak menjadi target.

Logo: 東京電力

**Standar kompetensi untuk *Engineering Manager* (Q4-3)**

Q. Ingin tahu jadwal pemberlakuan standar kompetensi

- Saat ini draft standar kompetensi yang telah diusulkan oleh JICA sedang dipelajari dan dipertimbangkan secara seksama oleh para pihak di Indonesia.
- Standar kompetensi yang telah diselesaikan akan dimintakan persetujuan kepada pemerintah, kemudian menetapkan lembaga sertifikasi dan menyiapkan sistem kualifikasi sehingga diperkirakan perlu mengerjakan desain sistem paling cepat pada akhir 2010.
- Detilnya akan dipertimbangkan oleh DESDM di kemudian hari.

Logo: 東京電力

**Standar kompetensi untuk *Engineering Manager* (Q4-4)**

Q. Ditetapkan bahwa harus menugaskan *Engineering Manager* yang telah memperoleh sertifikasi kompetensi. Bukankah sulit untuk mendapatkan sertifikasi kompetensi baru dengan cepat?

- Bila berfokus pada pelaksanaan sertifikasi dengan melakukan pengujian terhadap calon-calon dalam jumlah besar saat mengadopsi *Engineering Manager* System secara serentak, mungkin akan menimbulkan kebingungan.
- Bisa dilakukan dengan masa transisi misalnya melalui pemberian sertifikasi sementara di awal yang berlaku hanya beberapa tahun saja kepada mereka yang memiliki pengalaman tertentu, kemudian secara bertahap berpindah ke sertifikasi resmi melalui pengujian dll.
- Detilnya akan dipertimbangkan oleh DESDM di kemudian hari.

Logo: 東京電力

**Standar kompetensi untuk *Engineering Manager* (Q4-5)**

Q. Standar kompetensi yang telah diusulkan kali ini tampaknya dikhususkan pada syarat kompetensi secara teknis. Apakah kemampuan lain non-teknis, seperti kemampuan membimbing selaku manajer, dll tidak dipertanyakan?

- Standar kompetensi yang telah diusulkan kali ini ditetapkan dari poin untuk mengevaluasi apakah memiliki kemampuan yang mumpuni untuk melaksanakan tugas *Engineering Manager* yang ditetapkan dalam regulasi sehingga dikhususkan pada syarat teknis.

Logo: 東京電力

### Standar kompetensi untuk *Engineering Manager* (Q4-6)

Q. Dalam mengemban tugas *Engineering Manager*, dituntut pengalaman kerja yang sesuai. Apakah boleh ditetapkan hanya berdasarkan ujian saja?

- Memungkinkan melalui ujian tulis atau pendidikan/pengalaman tertentu
- Dalam sistem sertifikasi teknisi di Jepang menitikberatkan pada pengecekan pengetahuan melalui ujian tulis, sedangkan di Indonesia bisa disesuaikan dengan sistem umum seperti pemastian pengalaman kerja, ujian lisan melalui wawancara, rekomendasi atasan, dll.
- Namun demikian, ujian tulis dianggap yang terbaik dalam mengevaluasi kemampuan secara obyektif sehingga ujian tulis diharapkan sebagai salah satu metode evaluasi. Tetapi mengingat pentingnya tugas *Engineering Manager*, maka tingkat kesulitan ujian harus diperketat.

### Standar kompetensi untuk *Engineering Manager* (Q4-7)

Q. Siapakah yang melakukan sertifikasi kompetensi dalam standar teknis *Engineering Manager*?

- Organisasi sertifikasi yang melakukan sertifikasi kompetensi untuk standar teknis yang ada saat ini (IATKI, HAKIT, GEMA PDKB, HATEKDIS) dianggap sebagai calon yang paling mampu.
- Detilnya akan dipertimbangkan oleh DESDM di kemudian hari.

### Standar kompetensi untuk *Engineering Manager* (Q4-8)

Q. Siapakah yang menetapkan standar sertifikasi untuk standar kompetensi *Engineering Manager* dan level lulus/tidaknya?

- Patokannya standar kompetensi. Implementasinya sedang dalam proses pertimbangan dan akan ditetapkan oleh DESDM dengan mempertimbangkannya bersama lembaga sertifikasi kompetensi dan para pihak terkait lainnya.

### Standar kompetensi untuk *Engineering Manager* (Q4-9)

Q. Apakah standar kompetensi *Engineering Manager* ini berlaku tanpa batas waktu atau ada masa berlakunya?

- Apabila telah diperoleh sekali akan menjadi sertifikasi permanen.
- Namun perlu disediakan wadah penukaran dan penyediaan informasi yang berkaitan dengan contoh kasus kecelakaan, tindakan preventif, perkembangan teknologi dll melalui lokakarya, tinjauan lapangan dll.

## III. Action Plan for MEMR after the completion of the Study

## National Safety Requirements

### Action 1: Legislation of National Safety Requirements

#### Recommended Action [and period]

- Completion of the Governmental Regulation [by September 2010]
- Development of the new Ministerial Decree [by September 2010]
- Hosting a forum / seminar / workshop for related stakeholders to share understanding [by September 2010]
- Distribution of edification brochure (based on the draft prepared by the Study Team) [by September 2010]





## National Safety Requirements (cont'd)


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**Action 2: Developing implementation guidelines to supplement National Safety Requirements**

Recommended Action [and period]

- Development of Implementation Guidelines of *National Safety Requirements* with more specific criteria [by December 2011]
- Completion of SNI/PUIL to cover the entire facilities related to electrical power supply [by December 2011]

 55



## Safety Rules


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**Action 1: Legislation of Safety Rules**

Recommended Action [and period]

**[Likewise with National Safety Requirements]**

- Completion of the Governmental Regulation [by September 2010]
- Development of the new Ministerial Decree [by September 2010]
- Hosting a forum / seminar / workshop for related stakeholders to share understanding [by September 2010]
- Distribution of edification brochure (based on the draft prepared by the Study Team) [by September 2010]

 56




## Safety Rules (cont'd)


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**Action 2: Developing guidelines to specify Safety Rules**

Recommended Action [and period]

- Determining the roles of the Government and utilities in developing *Safety Rules* [by September 2010]
- Developing a detailed guidelines to define the specification of *Safety Rules* system (as well as providing a template of *Safety Rules*) [by December 2011]

 57



## Safety Rules (cont'd)

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**Action 3: Roadmap for full adoption of Safety Rules system**


Recommended Action [and period]


- Determine the period and targeted facilities for implementation [by June 2010]

**Action 4: Further expanding the target of Safety Rules as next steps in the future**

Recommended Action [and period]

- Discussion for applying *Safety Rules* system to power users' facilities and captive power [after 2011]

 58



## Engineering Manager System


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**Action 1: Legislation of Engineering Manager system**

Recommended Action [and period]

**[Likewise with National Safety Requirements & Safety Rules]**

- Completion of the Governmental Regulation [by September 2010]
- Development of the new Ministerial Decree [by September 2010]
- Hosting a forum / seminar / workshop for related stakeholders to share understanding [by September 2010]
- Distribution of edification brochure (based on the draft prepared by the Study Team) [by September 2010]

 59




## Engineering Manager System (cont'd)


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**Action 2: Developing guidelines to specify Engineering Manager system**

Recommended Action [and period]

- Developing a guidelines (templates) to define the roles and responsibilities of *Engineering Manager* [by December 2011]

 60

<Appendix> Main Tasks of *Engineering Manager* (proposed) 

**Construction**


1. Supervision on facility construction plan;
2. Assessing the conformity of construction designing to *National Safety Requirements*;
3. Site investigation during construction works;
4. Inspection before commissioning;


**Operation**

1. Development of annual activity plan on safety management;
2. Supervision on submission of application / notification documents to the authority;
3. Supervision and assessment of safety rules and manuals;
4. Planning and implementation of safety education
5. Attendance at meetings related to safety management

**Maintenance**

1. Assessment of the condition of facilities in operation (site investigation)
2. Assessment of safety management
3. Supervision on the revision of site patrol policy
4. Measures against abnormalities and/or accidents/troubles
5. Cooperation with statutory inspection carried out by the Inspector

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*Engineering Manager* System (cont'd) 

**Action 3: Roadmap for full adoption of *Engineering Manager* System**

Recommended Action [and period]

[Likewise with *Safety Rules*]


- Determine the period and targeted facilities for implementation [by June 2010]


**Action 4: Further expanding the target of *Engineering Manager* System as next steps in the future**

Recommended Action [and period]

[Likewise with *Safety Rules*]

- Discussion for applying *Engineering Manager* system to power users' facilities and captive power [after 2011]

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Standar kompetensi untuk *Engineering Manager* 

**Action 1: Completion of the list of Competency Units**


Recommended Action [and period]


- Completion of the entire list of Competency Units following the receipt of the 1<sup>st</sup> draft provided by the JICA Study Team [by December 2010]

**Action 2: Taking necessary procedures for authorization**

Recommended Action [and period]

- Gaining approval within MEMR [by June 2011]


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Standar kompetensi untuk *Engineering Manager* 

**Action 3: Developing the institutional scheme of certifying *Engineering Manager***

Recommended Action [and period]

- Determining the entities to undertake certification [by December 2011]
- Assisting the aforementioned entities in developing certification system [by December 2011]
- Concluding an agreement with the aforementioned entities to entrust the certification [by December 2011]
- Establish a section within MEMR to license *Engineering Manager* [by December 2011]


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Standar kompetensi untuk *Engineering Manager* 

**Action 4: Developing the institutional scheme of certifying *Engineering Manager***

Recommended Action [and period]

- Estimating the workload for certifying all potential applicants [by September 2010]
- Determining the transitional period before full adoption [by September 2010]
- Hosting a forum / seminar / workshop & developing edification brochure (when needed) [by September 2010]

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