

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

**THE STUDY  
ON  
DEVELOPMENT  
OF TECHNICAL STANDARDS  
AND COMPETENCY STANDARDS  
IN ELECTRICAL POWER SECTOR  
IN INDONESIA**

**FINAL REPORT  
(Summary)**

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**JAPAN INTERNATIONAL COOPERATION AGENCY  
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## Abbreviations

ANSI	American National Standard Institute
ASEAN	Association of South East Asian Nations
BAPETEN	Nuclear Energy Regulatory Agency ( <i>Badan Pengawas Tenaga Nuklir</i> )
BAPPENAS	National Development Planning Agency ( <i>Badan Perencanaan Pembangunan Nasional</i> )
BATAN	National Atomic Energy Agency ( <i>Badan Tenaga Atom Nasional</i> )
BNSP	National Board of Profession Certification ( <i>Badan Nasional Sertifikasi Profesi</i> )
BS	British Standards
BSN	National Standardization Agency ( <i>Badan Standardisasi Nasional</i> )
C/P	Counterpart
DEN	National Energy Council ( <i>Dewan Energi Nasional</i> )
DG	Diesel Generator
DGEEU	Directorate General Electricity and Energy Utilization
GBU	Generation Business Unit
GT	Gas Turbine
IEC	International Electro technical Commission
IEEE	Institute of Electrical and Electronic Engineers
IP	PT Indonesia Power
IPP	Independent Power Producer
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standards
KAN	National Accreditation Committee ( <i>Komite Akreditasi Nasional</i> )
KONSUIL	Safety National Committee for Electrical facility ( <i>Komite Nasional Keselamatan untuk Instalasi Listrik</i> )
KUD	Village Unit Cooperative ( <i>Koperasi Unit Desa</i> )
MEMR	Ministry of Energy and Mineral Resources
MOF	Ministry of Finance
NQF	National Qualification Framework
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
P3B JB	Java Bali Transmission and Load Dispatching Center ( <i>Penyaluran dan Pusat Pengatur Beban Jawa Bali</i> )
PJB	PT Pembangkitan Jawa-Bali
PLN	PT PLN (Persero)
PUIL	Electric Facility General Regulation ( <i>Peraturan Umum Instalasi Listrik</i> )
RUKN	National Electricity General Plan ( <i>Rencana Umum Ketenagalistrikan Nasional</i> )
R&D	Research and Development
SCADA	Supervisory Control and Data Acquisition
SKKNI	Indonesian Standard for National Competency Standardization ( <i>Standar Kompetensi Kerja Nasional Indonesia</i> )
SNI	Indonesia National Standard ( <i>Standar Nasional Indonesia</i> )
SOP	Standard of Operation
SPLN	Standard PLN
ST	Steam Turbine
S/W	Scope of Work
TEMA	Tubular Exchanger Manufacturers Association
UPB	Load Dispatching Unit ( <i>Unit Pengatur Beban</i> )
UPT	Transmission Service Unit ( <i>Unit Pelayanan Transmisi</i> )
WTO	World Trade Organization

## Chapter 1 Introduction

### 1.1. Background

Indonesia overcame the monetary crisis in the late 1990s and has recently achieved stable economic growth, while foreign direct investment still increases at a sluggish pace with real recovery of economic growth yet to be seen. There is, therefore, a substantial need for the influx of foreign direct investment through the improvement of investment climate, and in particular there is an urgent need for development of an economic infrastructure of which electric power will play a substantial role.

In order to relieve the electric power sector from chronic power shortage, promoting sophistication and diversification of the electrical facilities by improving the capacity use of existing power facilities and increasing the power generation capacity of Independent Power Producers (IPPs) through the liberalization of the electric power market is required. At the same time, in order to enhance the human capacity of personnel who operate, maintain and manage electrical facilities, the Government of Indonesia has been addressing the establishment of qualification systems for engineers and technicians who are engaged in the electric power sector. As qualification areas for technician engaged in the power sector, more than 2,000 technical competency units for entry-level technicians have been specified until now and accredited competency certification bodies have issued more than 12,000 certifications.

Since law No.15 of the year 1985 on Electric Power in Indonesia stipulates that the Government of Indonesia should develop an efficient electric power sector through stable electric power supply and utilization in an environment with reliability and safety, the Government has so far been addressing the establishment of various technical standards and safety regulations. Under such conditions, many countries have concluded Free Trade Agreements (FTA) with increasing globalization, and the improvement of international competitiveness in Indonesia, especially human resource development, has become a major issue. While the Government Regulation in the No.3 year 2005 stipulates that every technician working in electric power sector is required to have a competency certification in accordance with laws and regulations, the inefficiency of qualification systems has been pointed out due to the fact that some of the existing competency standards are not appropriate to international standards. In the future, the development of competency standards and qualification systems for management-level personnel who are in position to manage entry-level technicians will be required.

In light of the aforementioned background, the Government of Indonesia requested the Government



of Japan to conduct a study on the development of technical competency standards and qualification systems based on the competency standards through review of existing electric power competency standards.

## 1.2. Objectives of the Study

The objectives of the Study are to carry out the following two items for contributing the enhancement of human resources supporting operations, maintenance and the management of electrical facilities that have been newly introduced in a bid to relieve chronic power shortage in Indonesia.

- 1) Development of technical standards in electric power sector, appropriate to international standards
- 2) Development of competency standards for national qualifications based on the aforementioned technical standards and relevant qualification systems

## 1.3. Target Area

The Study covers the whole country of Indonesia.

## 1.4. Scope of the Study

The Study was carried out in accordance with the Scope of Work (S/W) signed in October 2008 and covers the followings.

1. Review of existing technical standards, competency standards and qualification systems
  - 1) Confirmation of the existing electrical facilities
  - 2) Review of existing technical standards
  - 3) Review of competency standards for entry-level technicians
  - 4) Review of existing qualification systems
2. Development of technical standards in the electric power sector in selected fields
  - 1) Review of technical standards in the electric power sector in Japan and the ASEAN countries
  - 2) Development of new technical standards in the electric power sector in selected fields (generation, transmission and distribution)
3. Development of competency standards for management level personnel
4. Development of qualification systems based on competency standards for management level personnel

- 1) Review of Japanese qualification systems and the introduction of them into Indonesia
- 2) Development of qualification systems for management level personnel
5. Seminars aimed at presenting the progress of the Study

Since the Government of Indonesia is expected to make an effort to legislate the technical standards, competency standards and qualification systems based on the competency standards which the JICA Study Team proposes, the JICA Study Team was required to look into those legislations, in consideration of the comments and opinions received from the Indonesian counterparts throughout the Study.

The basic concept of the Study is understood as shown in Figure 1.4-1

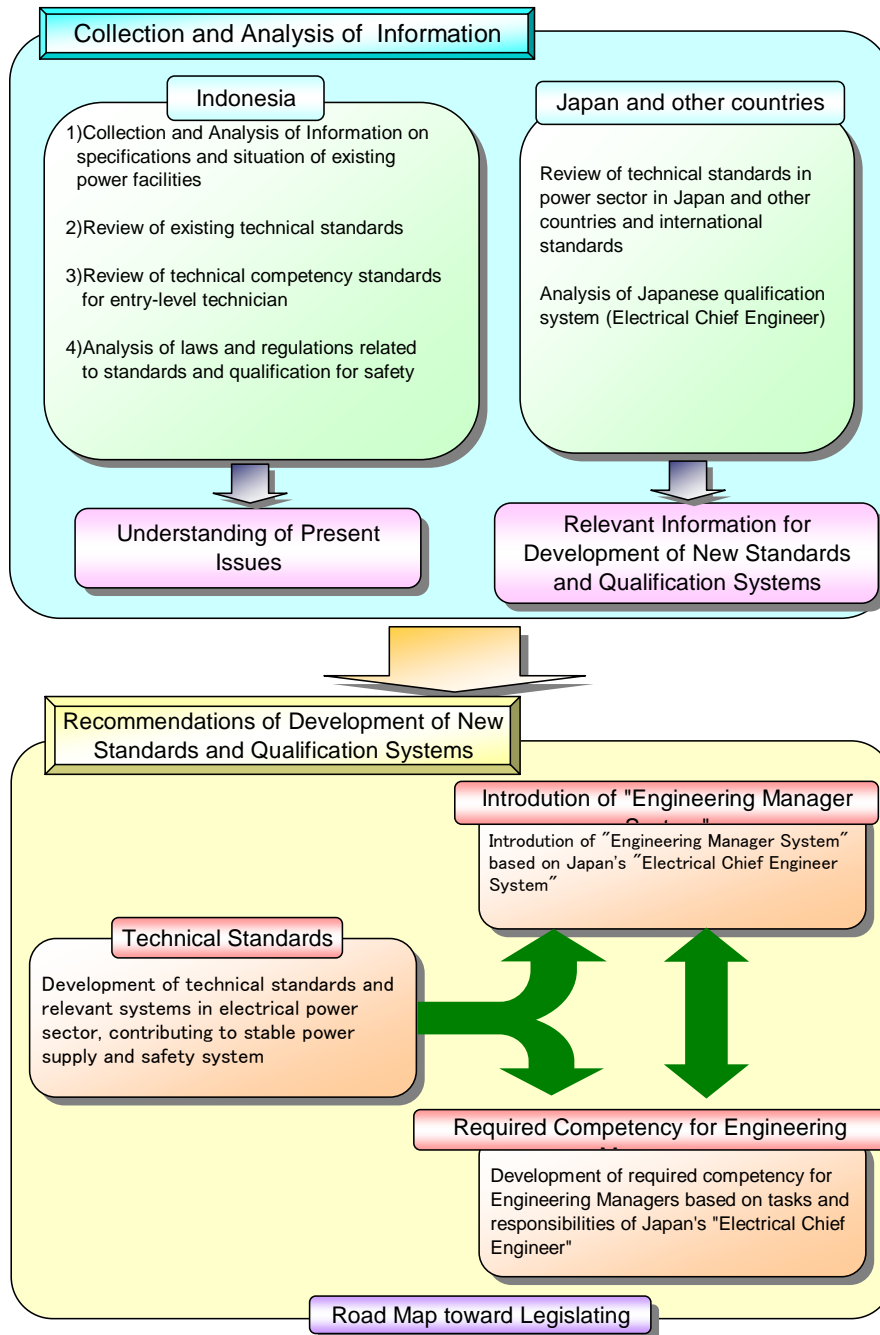


Figure 1.4-1 Basic Concept of the Study

## **Chapter 2 Current Status of Power Sector in Indonesia**

### **2.1. Overview of the Main Stakeholders**

PT PLN (Persero) is a 100 %-state-owned power utility company, which covers the whole of Indonesia. (In some special regions, PLN's subsidiaries supply electricity.) In consideration of the progress being made in the restructuring of the electric power sector, the PLN has addressed some reforms such as creating the power generation sector including its subsidiaries and separating the transmission and distribution sectors into business units. However, the organization's structure still remains as a vertical integration, and it has been undertaking electric power supply throughout Indonesia under the supervision of MEMR. In the power generation sector, not only the PLN and its subsidiaries, PT Indonesia Power (IP) and PT Pembangkitan Jawa-Bali (PJB), which were spun off from the PLN's power generation sector in Java-Bali region, but also Independent Power Producers (IPPs), which have been allowed to participate in the Indonesian power sector since 1992, play a role in electric power supply. As for the transmission and distribution sectors, with the exception of some organizations such as communities for rural electrification and business entities supplying electricity in certain areas, the PLN has been monopolizing these sectors up until now. The overall framework of the electric power sector in Indonesia is shown in Figure 2.1-1.

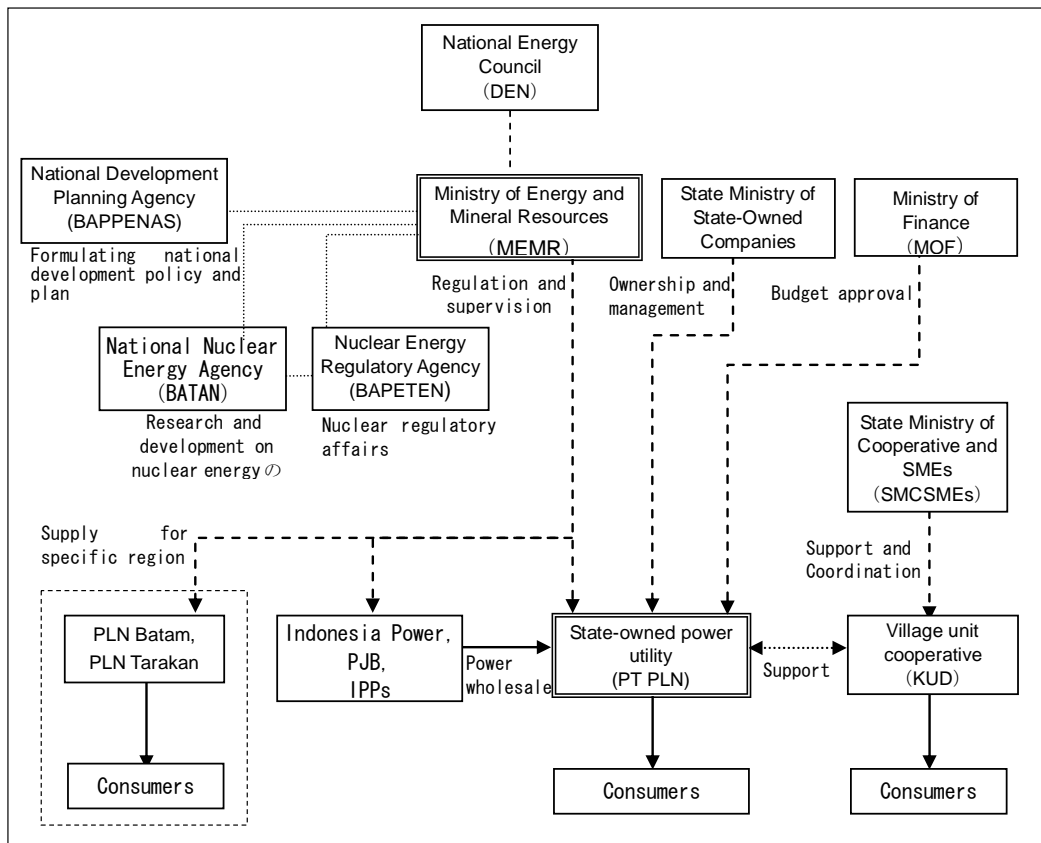


Figure 2.1-1 Overview of Electric Power Sector of Indonesia

## Chapter 3 Current Status of Safety Management on Electrical Facilities

### 3.1. Legal Structure Related to Safety Management on Power Facilities

#### 3.1.1. Establishment of the New Electricity Law and Development of Related Regulations and Decrees

The electric power utility business in Indonesia has been conducted based on the “Electricity Law No.15/ 1985” as a fundamental law. However, due to the fact that the actual implementation of decentralization has started since January 2001 based on the “Law No. 22/1999 on Regional Governance” and “Law No. 25/1999 on Fiscal Balance between the Center and the Regions”, the electric power sector needed to adopt the concept of such decentralization and it was required to clarify both the rules of the central and local government of the electric power sector. In order to cope with the change, the new electricity law No.30/2009 was established in September 2009 so that the electric power sector could deal with the trends of decentralization.

The new electricity law (No.30/2009) has been basically covering up the contents of the old electricity law (No.15/ 1985), however, the following points are modified and the new law stipulates that the detailed articles are to be in the governmental regulation presently under development.

- Procedures of national electric power development planning
- Procedure of electricity tariff change.

The following table lists the major articles stipulated in the new electricity law.

**Table 3.1-1 Major Articles in Electricity Industry Law (No.30, 2009)**

Article	Outline of Article
Article 2	<ul style="list-style-type: none"> <li>Principle and Purposes of Electric Power Development</li> </ul>
Article 3	<ul style="list-style-type: none"> <li>Responsibilities in Power Supply Businesses (Central Government &amp; Local Government)</li> </ul>
Article 5	<ul style="list-style-type: none"> <li>Authority of government in utility business (Policy development, regulation/guideline development, RUKN development, approval, etc.)</li> <li>Authority of state government in utility business (Local policy development, local RUKN development, approval, etc.)</li> </ul>
Article 7	<ul style="list-style-type: none"> <li>Methodology/process of RUKN development</li> </ul>
Article 8	<ul style="list-style-type: none"> <li>Structure of utility business (supply and support)</li> </ul>
Article 28	<ul style="list-style-type: none"> <li>Obligation of power supply business entities (power quality, reliability, compliance with safety requirements, priority use of national products)</li> </ul>
Article 36	<ul style="list-style-type: none"> <li>Obligation of power utilization side (protect from dangerous, maintain safety)</li> </ul>
Article 44	<ul style="list-style-type: none"> <li>Comply with safety regulation in utility business activities</li> <li>Purposes of safety compliance (maintain dsafety and reliability of facilities, safety against human body and others, environmental protection)</li> <li>Items to be included in safety regulation (satisfaction of national standard)</li> </ul>

Article 28, 36, 44 of the new electricity law regarding safety compliances for electric facilities have been extracted from article 9, 15, 17 in the old electricity law, and it could be concluded that there are no differences between then old and new laws regarding the basic ideas governing safety. However, the number of articles has more than doubled from 28 to 58 compared with the conventional law and contents have become more detailed. Under the new electricity law, article 44 stipulates the following contents which have not been included in the conventional law.

- 1) Each electric power facility shall obtain certification regarding appropriate operations capability
- 2) All electrical appliances and equipment shall satisfy the relevant Indonesian National Standards (SNI)
- 3) Each engineer working in the power industry shall obtain the certification of competency.

Based on the new electricity law mentioned above, new governmental regulation which is under development is expected to cover the following contents.

- Safety requirements of electric power facilities

- Safety systems for securing the safety of electric power facilities

The new governmental law is presently being drafted by DGEEU based on the legislation of the new electricity law and is patterned after Indonesian regulations in terms of legislation procedure.

### **3.1.2. Legal Structure under the Old Electricity Law**

As described in 3.1.1, the power sector shall follow the electricity industry law No.30, 2009 as a fundamental law, and new government regulations and ministry decrees based on the new law are to be developed. However, as of February 2010, the existing regulation and decree are still effective. So here in this report, the JICA Study Team describes the analysis based on the conventional legal structure which the Team has studied in order to propose a new frame work for the electric power industry. Our view is that the study results are not affected even if the law which we have considered is old or new, because the points of proposal are based on the fundamental concepts for electric power safety which are considered to be eternal precepts.

The technical standards for the electric power industry in Indonesia are stipulated in the “Power Supply & Utilization (Government Regulation No.10/1989 and its revision No.3/2005)” and the “Electrical Facilities (Ministerial Decree No.45/2005 and its revision No.46/2006)” which are based on “Electricity No.15/1985(Old)”. Although these regulations and decrees will be replaced based on the new law, the basic concept governing the safety of electric power facilities has not changed.

The “Electric Power Utility Law No.15/1985” stipulates the fundamental policies in order to realize a sound business operation, Regarding the specific implementation of the electric utility business, Electricity stipulates that the “Government regulation of power supply and utilization No.10/1989” shall stipulate the basic regulations for the electric power industry

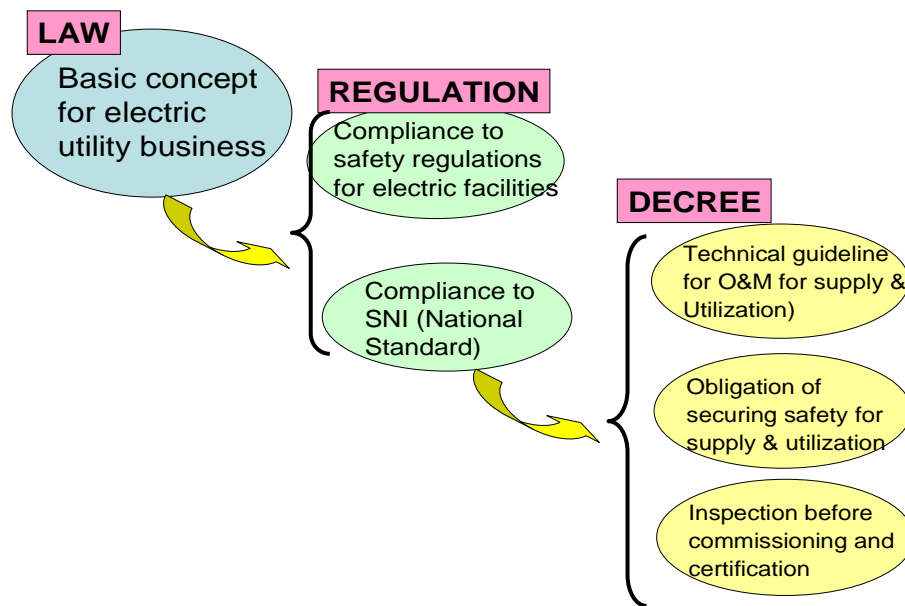
The “Ministerial decree of electrical facility (No.45/2005 & No.46/2006)” which considers both power supply facilities and power utilization facilities is stipulated based on the aforementioned government regulation. It stipulates the following issues regarding the construction or installation of electrical facilities.

- National standards for electric power industry (SNI)
- Technical standards for facility development
- Facility safety
- Operation & maintenance rules
- Details of commissioning test



Based on this ministry decree, the construction, operations & maintenance regulations for electric power facilities for both the supply side and utilization side have been legislated.

Based on the aforementioned legal system, the obligation of electric utilities concerning the installation, operation & maintenance and management of electrical facility is clearly stipulated, and the current electric utility business is implemented. The following figures summarize the basic image of the legal system at a glance.



**Figure 3.1-1 Basic Image of Legal System in Electric Utility Business**

### **3.2. National Standard of Indonesia (SNI)**

Regarding the SNI for electric power facilities including generation, transmission, and distribution, etc., they are still not developed completely yet. Among electric power supply facilities, SNI for “spillway”, civil facility, as one of the hydro power facilities has been already developed. On the other hand, there is no information that the SNI for thermal power facility is being developed. As far as we have studied, no SNI has existed for thermal power.

The SNI for distribution facilities (medium-low voltage distribution system and in-house wiring) has already been developed and the SNI covers the installation rules in addition to those of equipment and materials.

SNI for the distribution system including in-house wiring is called PUIL 2000 (Peraturan Umum

Instalasi Listrik : General Provisions of Electric Facilities) and PUIL 2000 covers the following areas.

- Design of electrical facilities
- Construction and installation
- Maintenance
- Inspection and test

As mentioned before, PUIL 2000 is referring to SNI for electric power supply materials or IEC (in case SNI is not available) and PUIL 2000 has existed as one of the SNI for distribution system development.

### **3.3. Power Utilities' Application of Technical Standards**

The aforementioned National Standard (SNI) is still insufficient as the standards that cover all the power facilities, though still under development. In this situation, as a major utility player, the PLN has developed and has been maintaining its own power facilities' standard named "Standar PLN (hereinafter SPLN)". PLN practically applies this SPLN to perform the inspections required by ministerial decrees on their power facilities.

### **3.4. Rules on Facility Operation**

Regarding the operation for electric power facilities, it is stipulated "It establishes Standard of Operation (SOP) for all equipment" by the Ministry of Labor, and worker of every company must follow the SOP which is established by each company.

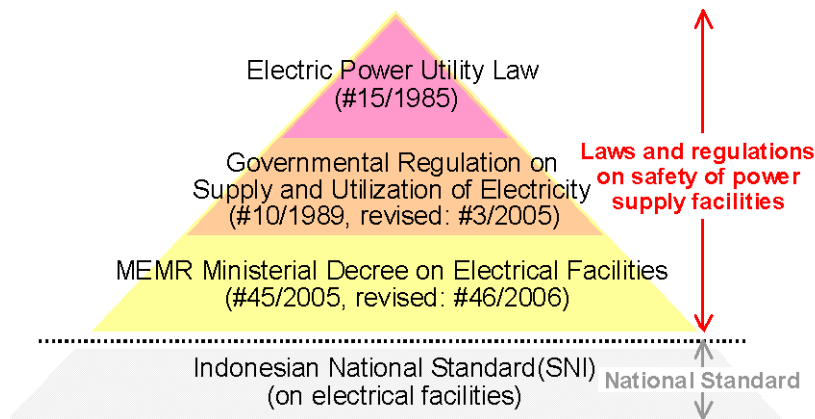
SOP differs for every company, and since it is general disclosure, only the person belonging to the company knows is privy. Moreover, a duty of the presentation to the government (Ministry of Labor) is not imposed, and since there are no penalties when it is performed that it is contrary to SOP, it cannot be said to be the systematic standard.

### **3.5. Facility Inspection**

Based on the Ministerial Decree No.45, 2005 on electrical facilities and the Ministerial Decree No.46, 2005 on electrical facilities, the facilities should be inspected and tested to confirm conformance with present standards subsequent to construction, installation or maintenance.

### 3.6. Problems Observed by the JICA Study Team

As described previously, the electric utility business follows the “Electricity Utility Law (No.15/1985)”, the “Government Regulation on Electric Power Supply & Utilization (No.10/1989, revision No.3/2005)” and the “Ministerial decree of electrical facilities (No.45, 2005 & No.46, 2006)” in Indonesia. Under this legal framework, electric power facilities are developed based on the SNI national standard. The following figure shows the legal system in Indonesia for the electric utility business.



**Figure 3.6-1 Current Laws and Regulations on Electrical Power Supply Facilities**

Securing the safety of electric power facilities is required under the aforementioned legal system. Regarding the safety management of the electricity supplies, Article 21 of the Government Regulations on Electric Power Supply and Utilization (No.10/1989, revised No.3/2005) stipulates the obligation to conform to “ordinance” and the rough outline of contents to be comprised in the “ordinance” is as follows:

[Article 21]

- (1) All the facilities for electricity supply must conform to the ordinance of electrical safety
  - (2) The ordinances on electrical safety stipulated in (1) shall comprise standardization, the security of electrical facilities, and the security of electricity utilization, for materializing power supply reliability, the safety of facilities, safety against human bodies, and environmental friendliness.
  - (3) Authorization of facilities for supplying and utilizing electricity must be done by an electric power support business entity that was qualified by a qualification body.
- (Omit the rest)

According to the Indonesian counterparts, the term “ordinance” here refers to the MEMR

Ministerial Decree on Electrical Facilities (No.45/2005, revised: No.46/2006). However, this Ministerial Decree is stipulated for procedures in inspecting power supply facilities and not for defining how electrical facilities should be designed and installed for assuring safety.

The following Article 22 of the Government Regulation stipulates the obligation of electrical facilities' conformance to SNI as follows:

[Article 22]

- (1) Electrical facilities mentioned in Article 21-(3) must conform to the Indonesian National Standard (SNI) (Omit the rest)

Here only the reference to SIN is indicated but there is no clearer description of why conformance to the SNI can assure safety in the electricity supply and what should be defined in SNI for security.

Even if specifications for electrical facilities are covered by SNI, though incomplete, no clear description is presented regarding the fundamental concept to explain the background of these specifications and so no close relation can be observed in the description between SNI and superordinate laws and regulations.

As discussed above, the current legal system for the Indonesian electric power sector is not designed systematically for securing safety in power supply, though it does only present rough stipulations regarding securing safety and the specifications on electrical appliances and installation.

It also needs to be noted that so far SNI and PUIL have developed specifications on low voltage electrical appliances and wiring regarding electrical utilization and specifications on the part of installing transmission and distribution facilities, but still many fields have been undeveloped such as the installation of power generation facilities. MEMR says that SNI will be expanded so that it will cover all the items related to electric power supply facilities in the future and that it will take considerable time for completion. Thus tentatively the application of other standards is acceptable such as SPLN, which is PLN's in-house technical standard, and IEC that is widely accepted in the world. That is, circumstances that have not been developed for strictly observing this Article.

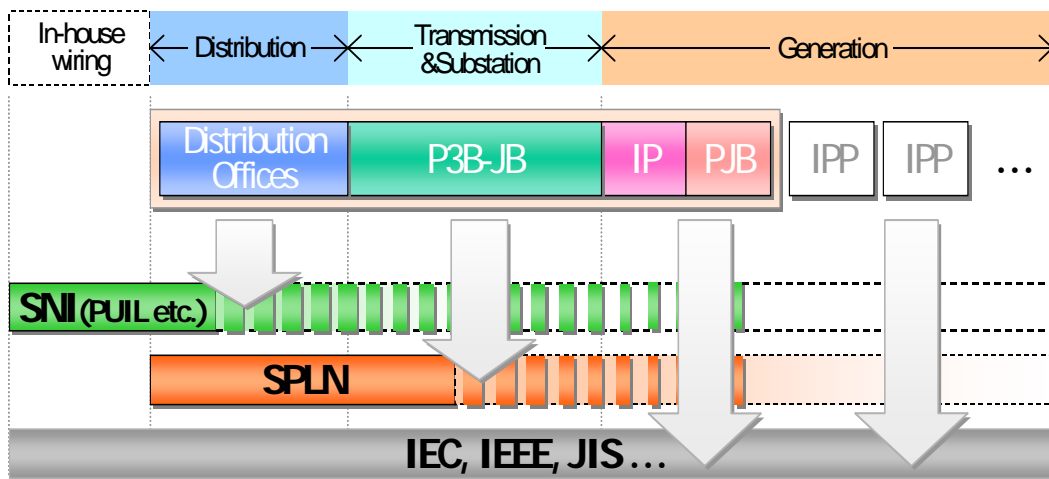


Figure 3.6-2 Application of Standards for Electrical Facilities Installation (SNI etc.)

Taking into account that it takes a considerable amount of time to develop SNI to cover all the items regarding electric power supply facilities and that there are already existing facilities that have extensively been installed and operated in conformance to other standards than SNI, this is a more realistic approach to prioritize the stipulation of minimum requirements that all facility must comply with, while tentatively accepting the applications of other technical standards.

The development of “minimum requirements” is also needed for effectively operating the inspection of newly installed (or modified) power supply facilities. Current regulation provides a checklist for inspection but no clear criteria and standards to be referred to for each inspection item. Hence there is a possibility that a dispute may occur between the owner/operator of a facility and the inspection body on the interpretation of facility specifications due to their reference to different standards. The minimum requirements, such as the “common platform” of which any facility must conform, will serve for arbitrating such disputes. Figure 3.6-3 depicts an image of the strengthened legal system.

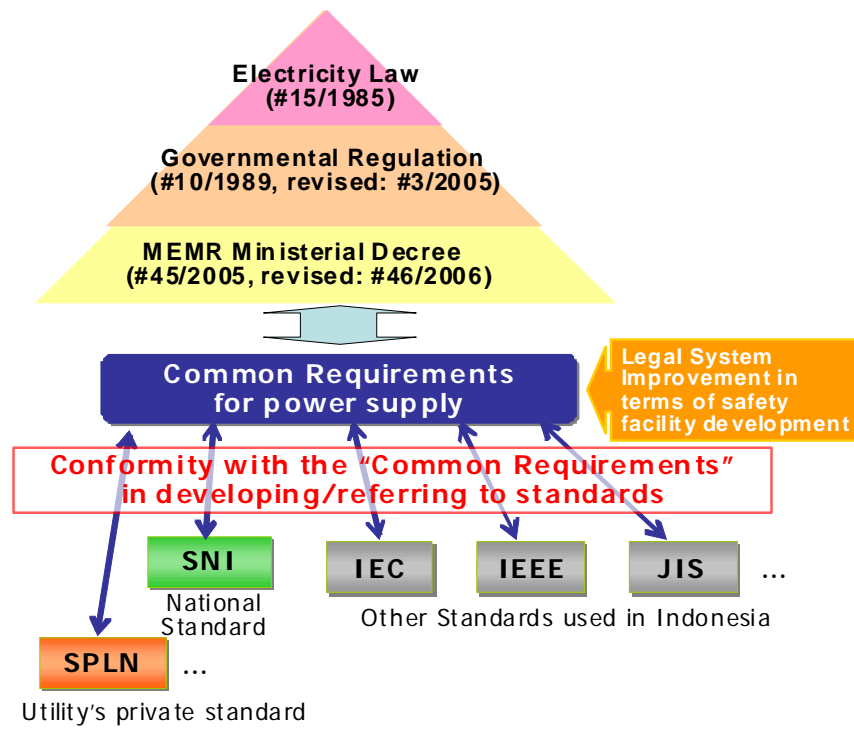


Figure 3.6-3 Image of Legal System Strengthening

## Chapter 4 Existing Competency Standards and Qualification Systems in the Electric Power Sector

### 4.1. Legal Structure and Organizations Related to the Electric Power Competency Standards and Qualification Systems

#### 4.1.1. Laws or Decrees on Competency Standards in the Electric Power Sector and related Organizations

Since the Electricity Law No. 30, 2009 has come into effect in 2009, the Electricity Law No. 15, 1985 had become invalid at the same time. However, related Governmental Regulations and Ministerial Decrees, which were established under Law No.15, 1985, have still been valid because new Governmental Regulations and Ministerial Decrees relating to Law No.30, 2009 are now under development. Accordingly, an analysis on the current situation of Competency Standards for the Electrical Power Sector is described according to Law No.15, 1985.

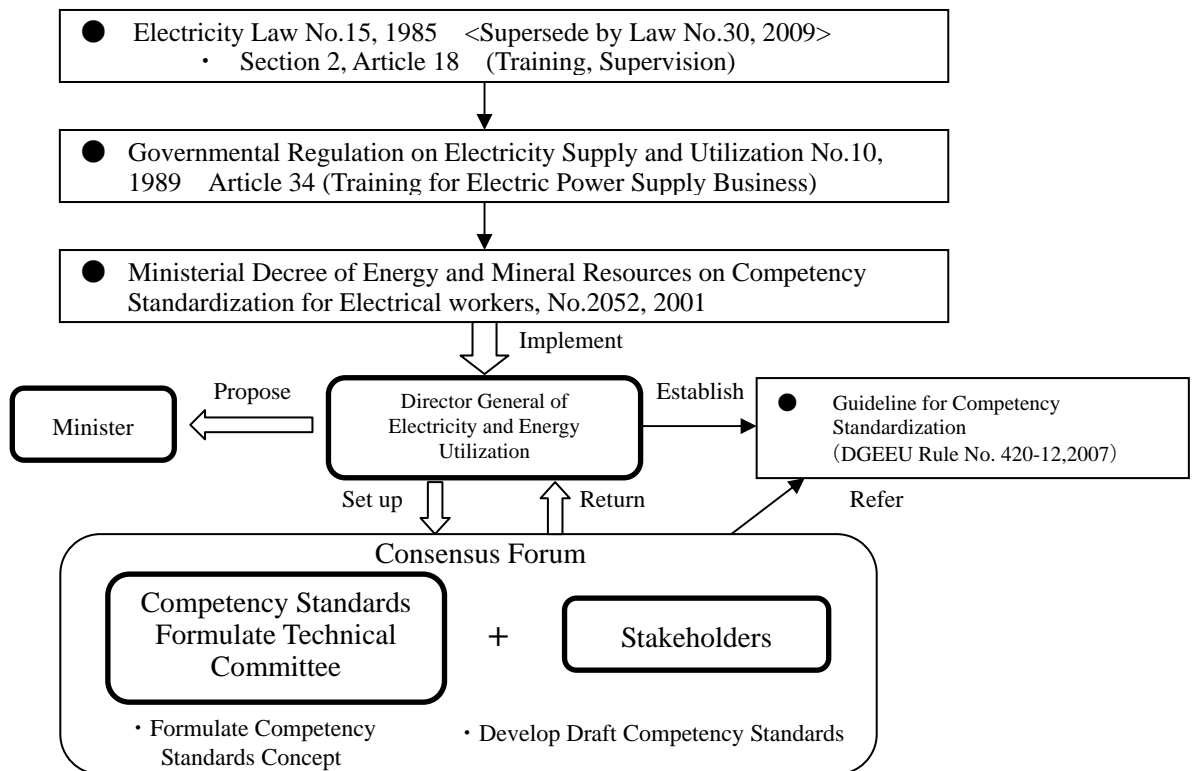


Figure 4.1-1 Laws or Decrees on Competency Standards in Electric Power Sector and related Organizations



When establishing Competency Standards, as shown in Figure 4.1-1, DGEEU firstly formulates a “Competency Standards Formulate Technical Committee”, and its committee formulates a basic concept for Competency Standards.

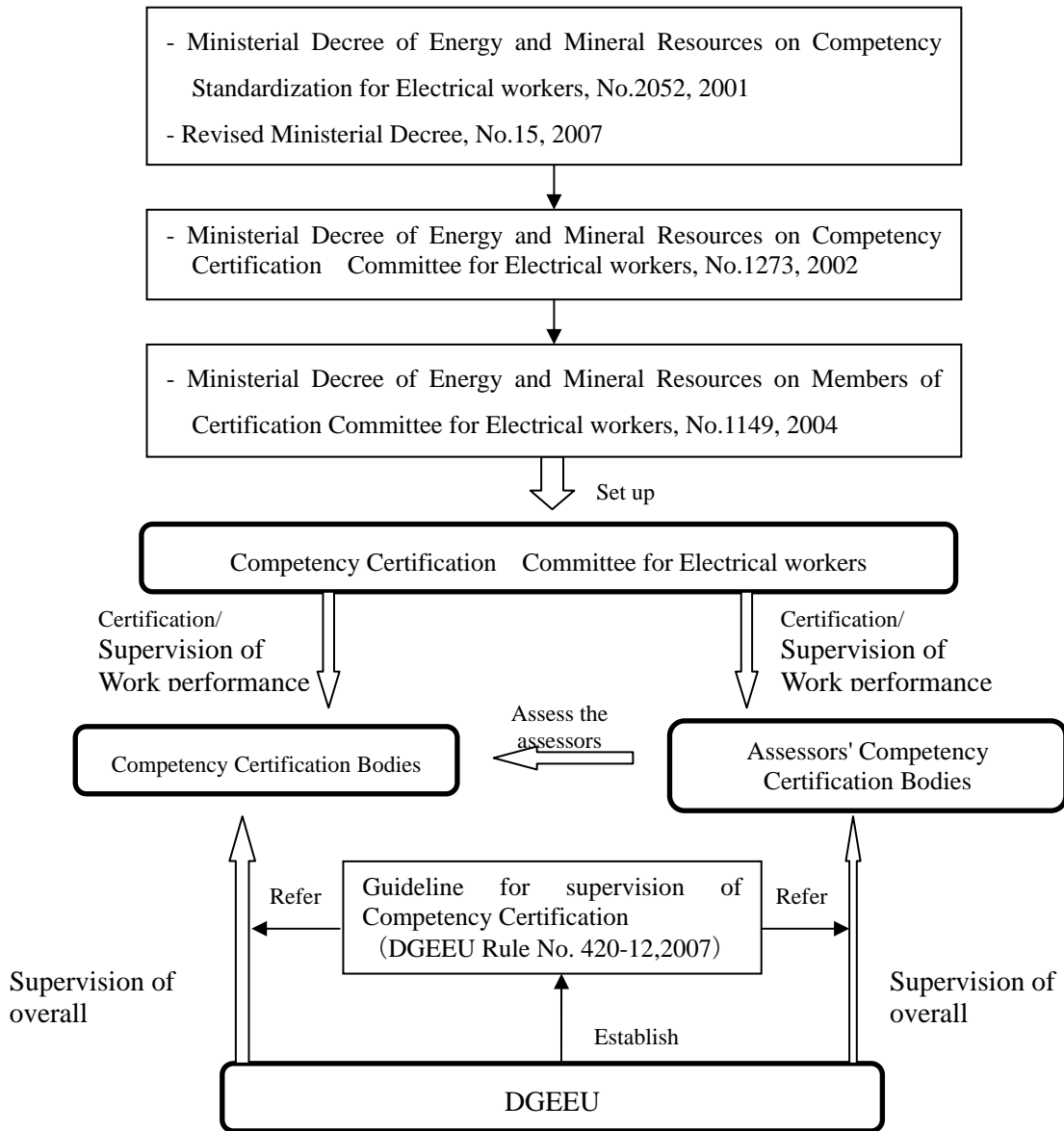
Then the “Consensus Forum”, which comprises of stakeholders, and “Competency Standards Formulate Technical Committee” will jointly draft the Competency Standards according to the basic concept for Competency Standards.

As a result of the discussion in the Consensus Forum, a final draft of the Competency Standards will be submitted by DGEEU to the minister of Energy and Mineral Resources. After the minister has accepted the final draft, the Competency Standards will come into effect as compulsory standards.

#### **4.1.2. Laws and Decrees on Certification Bodies for Competency Standards, and those related organizations**

Actual certifications to the Electrical workers are implemented according to the Competency Standards. Figure 4.1-2 shows the correlations among laws and decrees and the related organizations regarding the constitutions of the Certification Bodies and supervision.





**Figure 4.1-2 Laws and Decrees on Certification Bodies for Competency Standards, and those related organizations**

As shown in Figure 4.1-2, the Competency Certification Committee certifies the Competency Certification Bodies, and supervises the work performances of the Certification Bodies' judge and certification to the technicians.

Assessors' Competency Certification Bodies have functions to assess the assessors in Competency Certification Bodies. The Competency Certification Committee also has the responsibilities to certify Assessors' Competency Certification Bodies and supervise the work performances.



## 4.2. National Qualification Framework (NQF)

The Government Regulation of the National Vocational Training system (No.31/2006) stipulates that “Vocational trainings and competency certification shall conform to the National Vocational Competency Standards of Indonesia (Standar Kompetensi Kerja Nasional Indonesia : SKKNI, Indonesian Standard for National Competency Standardization: NCS) as well as the qualification system of the industrial sector, which is where the development of competency standards is clearly defined as a national policy target.

The competency requirements that are developed based on SKKNI are then systematically organized by referring to the National Qualification Framework (NQF). NQF are the common guidelines for each industrial sector to define the necessary competencies at each level of organizational positions. The BNSP has prepared the Indonesian National Qualification Framework.

Workers Qualifications based on the technical competencies are classified into six levels, from I to VI (The larger the number is, the higher the levels become).

## 4.3. National Competency Standard for Electric Power Sector

There are 2,200 competency units for the electrical engineers and 250 competency standard units for electrical assessors related to the electric power industry and electronic products regulated by DGEEU.



**Table 4.3-1 Competency Standard Units**

	Fields	Number of unit
Engineer	Generating facilities	1,235
	Transmission and Substation	318
	Distribution	197
	Electric equipments	149
	Electric equipments industry	79
	Electric appliances	91
	New Renewable Energy	150
	Training Facilities	48
	<b>Competency units for Engineers</b>	<b>2,267</b>
Assessor	Generating Assessors	239
	Transmission and Substation Assessors	15
	<b>Competency units for assessors</b>	<b>254</b>
	<b>Total Number</b>	<b>2,521</b>

Electric power engineers are given competency certifications in every 2,000 or more units listed above. These units are useful for not only the electric power industry, but also for similar competencies in other industries as nationally authorized.

These units which exceed 2,000 are classified into five fields and in each unit description, the required elements, evaluations and technical level to obtain the certifications.

- ① Planning
- ② Construction
- ③ Inspections
- ④ Operation
- ⑤ Maintenance

#### 4.3.1. Standard Format of National Competency Standard

Each competency standard is ordered by unit and is defined by the seven components according to the Regional Model Competency Standard (RMCS).

- 1. Unit Cords
- 2. Unit Title



3. Description of the Unit
4. Competency Element
5. Performance Criteria
6. Parameter of Competency
7. Evaluation Guidance

**Table 4.3-2 Definition of Competency and its Format**

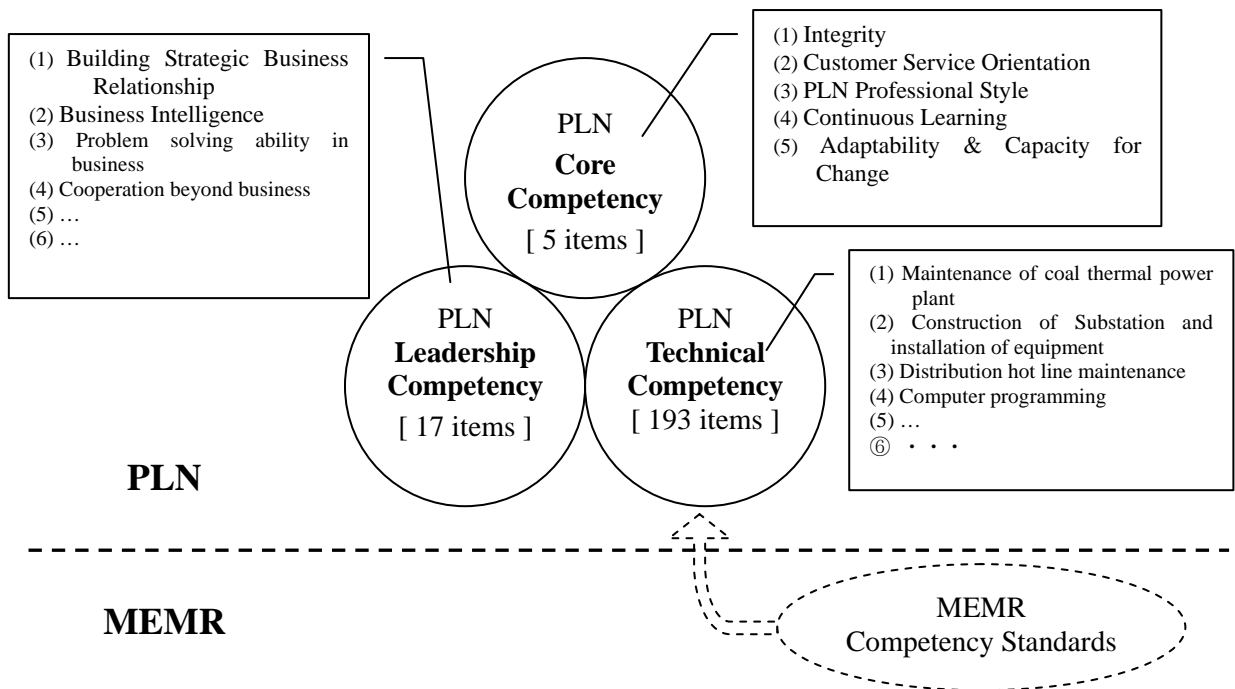
<b>1) Unit Cord (*1)</b> It is consist of both alphabets and numbers with the approval between the propounders and the stakeholders	
<b>2) Unit Title</b> Definition of relevant skill or knowledge for unit competency. Title should be described by the active sentence.	
<b>3) Description of Unit</b> Brief description of related unit	
<b>4) Competency Element (*2)</b> Unit element for achieving relevant competency unit Usually these are described by 3 -12 elements	<b>5) Performance Criteria</b> Performance results and output by competency elements (See left column). It should be measurable index with active sentence include knowledge, skill and attitude.
<b>6) Parameter of Unit Competency</b> Description of working circumstance as follows, Confirming rules / Procedures / Policy / Information relevant facilities	
<b>7) Evaluation Guidance (Clarification of Competency Level)</b> <ul style="list-style-type: none"> <li>• Evaluation of assigned procedures</li> <li>• Required initial condition for participants</li> <li>• Information of knowledge, skill and attitude related to this competency</li> <li>• Considerable profile related to this competency achievements</li> <li>• Seven Key items[A-G] (Each item is classified by Level 1-3) (*3)</li> </ul>	

#### **4.4. In-house Competency Standards in PLN**

The PLN has developed a “Competency Directory” to define the competencies of all the staffs, which PLN requires, for carrying out its corporate mission and realizing its corporate vision in 2004. This document is a modern and fair approach in light of abolishing unofficial and obsolete evaluation criteria and establishing official documentation available all over the corporation.

With this Competency Directory, it is possible to determine each employee’s competency and record that data, then to clarify the necessary knowledge and competencies for each post. Accordingly, it is possible to match the competencies, which are required in certain posts, and individual competencies, that each employee has. In addition, it is possible to use the Competency Directory as the indices for formulating the necessary capacity building program in order for PLN to become sustainable. That is, it is possible to evaluate, train and promote systematically and efficiently based on the “Competency Directory”.

The necessary competencies are defined to all the posts in PLN. PLN’s competencies are classified into three major groups, such as “Core Competency”, “Leadership Competency” and “Technical Competency”.



**Figure 4.4-1 Employees’ Competencies in PLN**



## 4.5. Qualification System and Its Operation

### 4.5.1. Operation regarding certification of competency standards

Figure 4.5-1 is the flowchart that details the process of acquiring competency certifications for technicians.

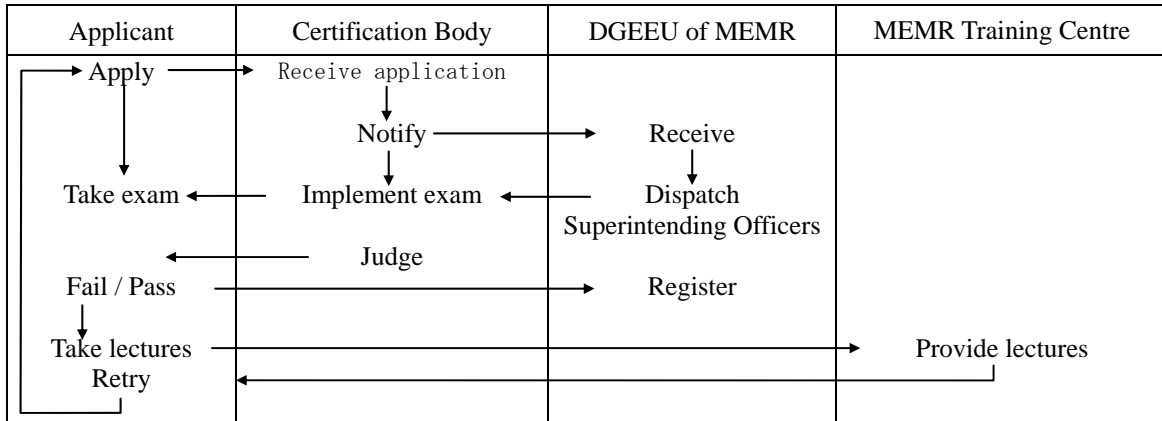


Figure 4.5-1 Competency Certification Acquiring Process

### 4.5.2. Existing Certification Bodies

Currently, there are four Certification Bodies for the Electric Power Sector. The following table shows the covered areas, of which each Certification Bodies implements certification operations.



Area	Concrete Operation	IATKI	HAKIT	GEMA PDKB	HATEKDIS
Generation	Planning				
	Construction				
	Operation				
	Maintenance				
	Inspection				
Transmission	Planning				
	Construction				
	Operation				
	Maintenance				
	Inspection				
Distribution	Planning				
	Construction				
	Operation				
	Maintenance				
	Inspection				
Installation	Planning				
	Construction				
	Operation				
	Maintenance				
	Inspection				

\* Colored cells mean the coverage by Certification Bodies

Figure 4.5-2 Covered Areas for certification operation by Existing Certification Bodies

## Chapter 5 Basic Policy of Developing Technical Standard and Competency Standard

### 5.1. Institutional Designing for Strengthening Safety Management on Electrical Facilities

#### 5.1.1. Proposing 3 Systems for Improving Electrical Safety

Since around 1990 the structure of the electric power sector in Indonesia has been in a transition shifting from PLN's monopoly to the diversified structure with various business entities such as IPPs and the functional separation of PLN. The enactment of the old Electricity Law (No.15/1985) became the trigger for this structural transition, but not enough managerial systems have been provided to deal with this new situation. During the transitional period of the electricity sector with diversified business entities, the institutional framework has not clearly defined what the Government is obliged to do as the regulator to supervise the safety of electrical facilities and what the utilities are obliged to do as the operator of the facilities.

In addition, Article No.22 of the Governmental Regulation for Power Supply and Utilization (No.10/1989, No.3/2005), which is still effective as of February 2010, stipulates that every electrical facility needs to conform to SNI. However, the actual situation is that the SNI for power supply facilities is still underdeveloped and, in order to make up for this, each power utility ends up adopting other technical standards at its own discretion.

The new Electricity Law (No.30/2009) to replace the old Electricity Law (No.15/1985) was enacted in September 2009 and then MEMR was slated to develop the subordinate new Governmental Regulations and Ministerial Decrees in one year. The general characteristic of the legal structure of Indonesia is that only the conceptual stipulations are provided in the supreme law and specific descriptions that affect actual practices are provided in the subordinate Regulations and Decrees. At the moment the Regulations and Decrees that were established under the old Electricity Law are still effective and no substantial changes have taken place.

Following this observation of the problems, the JICA Study Team presented to the counterpart agency MEMR *National Safety Requirements (NSR)*, *Safety Rules (SR)*, and *Engineering Manager (EM)* system, as the new systems for improving the safety of electrical facilities and has proposed to institutionalize them in the process of establishing new Governmental Regulations and new Ministerial Decrees:



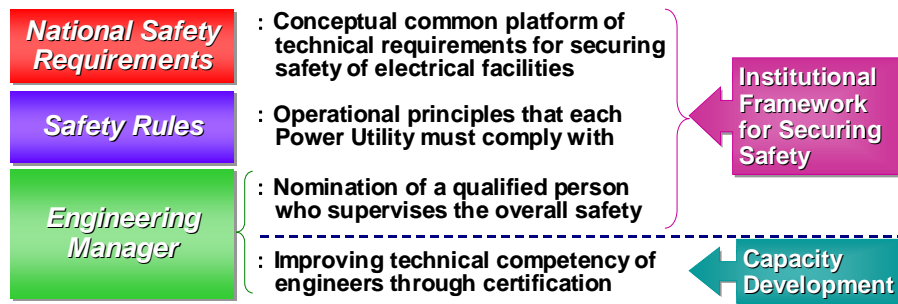


Figure 5.1-1 Proposed Three New System for Improving Electrical Safety

These three systems can be categorized into two groups: while *National Safety Requirements* fall within the institutional framework of facility conditions, the *Safety Rules* and *Engineering Manager* System belong to an institutional framework on business operations for achieving and maintaining the facility conditions as stipulated in the *National Safety Requirements*.

### 5.1.2. National Safety Requirements

Following this observation on the current status of the safety management of electrical facilities, the JICA Study Team came to the conclusion that, continuous efforts to complete SNI that covers comprehensively all kinds of electrical facilities needs to be tackled as mid-term or long-term challenges, but that more priority should be given to institutionalizing the basic philosophy of securing safety of facilities at a more conceptual level. Based on this conclusion, the JICA Study Team has proposed developing and Institutionalizing the *National Safety Requirements*, which is the common platform of technical specifications of electrical facilities.

*National Safety Requirements* will play a role, as the superordinate ordinance for the technical standards that power utilities are adopting, to provide a foundation for assessing whether these standards are appropriate for securing the safety of electrical facilities. In case the Government judges that a part of such technical standards adopted by a power utility is not sufficient for fulfilling these conditions, the power utility is requested to apply appropriate amendments. *National Safety Requirements* are also expected to help develop SNI systematically as the superordinate conceptual platform to indicate the total to-be framework of .SNI.

In addition, the current “Ministerial Decree of Electrical Facilities” that was established under the old Electricity Law and is still effective as of February 2010, stipulates the inspection of electrical facilities carried out by inspection bodies designated by the Government, but no

common rules have been established between facility inspectors and the owner/user of said facilities to be applied universally. The institutionalization of the *National Safety Requirements*, which will be positioned above the individual technical standards/specifications, is expected to provide common judgment criteria between the inspectors and facility owners/users.

These were the comments from the officers of the Indonesian counterpart MEMR-DGEEU regarding the JICA Study Team's proposal that MEMR has also recognized the problem that the current legal framework only provides ambiguous descriptions on safety management and in practice there was an argument within MEMR-DGEEU around 2007 for establishing a regulation that stipulates more specifically how to secure the safety of electricity supply, which has not materialized as legislation, showing their willingness to accept the JICA Study Team's proposal.

### **5.1.3. Safety Management Based on *Safety Rules* System**

Clearly defining the roles of Government (regulator) and power utilities (operator) regarding the safety management of facilities is also important from a viewpoint of maintaining the status of facilities as specified in the *National Safety Requirements* in the daily business operations. Based on this idea, the JICA Study Team proposed a system, in which power utilities are obliged to compile their basic policy of facility operation as *Safety Rules* and submit them to the Government. The Government assesses the submitted *Safety Rules* and, when the Government finds that the operational policy described in the *Safety Rules* is not sufficient for maintaining the facility conditions as stipulated in *National Safety Requirements*, it can order the power utilities to amend the *Safety Rules*. The Government also regularly monitors whether or not the business operations of power utilities are in compliance with *Safety Rules* and can order the power utilities to improve their business practices when their activities are not in compliance. Each power utility is obliged to nominate a necessary number of *Engineering Managers*, who are the pivotal personnel in the organizational and operational setup for the safety of facilities.

The description of *Safety Rules* does not go beyond the basic operational policy of electrical facilities and power utilities need to prepare more detailed operational manuals in order to define their business operations more specifically in conformance to the *Safety Rules*.

There were the comments from the MEMR-DGEEU officers on the *Safety Rules* and *Engineering Manager* systems showing their willingness to accept these systems, that in

Indonesian there is statutory facility inspection carried out by inspection bodies, but there is no institutional framework for the Government to verify the power utilities' daily routine under real time circumstances. Thus, obliging the power utilities to develop and submit Safety Rules as the basic policy of business operations will help make their daily routine transparent to the Government, and the nominating *Engineering Manager* helps by identifying the counterpart of the Inspector legally.

#### **5.1.4. Establishment of *Engineering Manager* System**

Nominating a person possessing certain competencies to the position of *Engineering Manager* and assigning considerable discretion on facility safety will help clarify the structure of responsibility within a power utility regarding safety management. The *Engineering Manager* assumes responsibility for the overall supervision of the construction, operations and maintenance activities of the facilities under his/her jurisdiction, and for the supervision of the technical reporting to the Government. The final responsibility for the business operations, including the responsibility for the facility's safety, belongs to the General Manager, but the *Engineering Manager* provides necessary information to the General Manager as his technical advisor and assumes accountability to top management and to the Government on behalf of the General Manager when the necessary reporting exclusively deals with technical matters.

In preparing *Safety Rules*, each power utility is required to describe explicitly how to position *Engineering Managers* in their organization as a part of the overall safety management structure, though the number of *Engineering Managers* and positioning in the organizational hierarchy can be primarily left up to the initiative of each power utility. However, the Government can order the power utility to revise the *Safety Rules* when it finds that the number of assigned *Engineering Managers* does not appear to be sufficient.

### **5.2. Development of Competency Standards for *Engineering Managers***

#### **5.2.1. Institutional Design for Strengthening Electrical Safety Management and Development of Competency Standard**

The *Engineering Manager* system requires personnel possessing a high-level of technical knowledge to assume this position. Therefore, the JICA Study Team proposed that the person who will be nominated as an *Engineering Manager* needs to acquire the necessary qualifications.

### 5.2.2. Consistency with National Qualification Framework (NQF)

It also needs to be noted that, whereas the main objective of the Indonesian NQF is to improve and standardize the capacity of engineers within the electric power sector, Japan's Chief Engineer system, which is the foundation of the proposed *Engineering Manager* system, has been developed as a part of the safety management system of electrical facilities, and due to the differences in characteristics, transplanting from one to another cannot be done mechanically.

In Japan, there is also vocational qualification system, which may be more similar to Indonesia's NQF by nature, but has historically been developed by each individual business entity. In Japan there is no national vocational qualification system like the Indonesian NQF that defines technical competencies for each industrial sector and vocational level nationwide. The technical competency for high-level officers cannot be found in the vocational qualification system of Japan's electric power utilities. In Japan, Chief Engineers are expected to play a role of high-level officers responsible for supervising and directing technical matters. The candidate of Chief Engineer is requested to acquire the necessary qualifications as stipulated under Japan's Electric Utility Industry Law and a similarity with Indonesian NQF can be found from this perspective.

### 5.2.3. Basic Policy of Developing Competency Standard in this Study

Following the observations in the previous section, the JICA Study Team came to the conclusion that developing competency standards for the *Engineering Manager* by referring to Japan's Chief Engineer system would be the best solution in this Study. The Study has proposed three systems for improving the safety of electrical facilities, i.e. *National Safety Requirements*, *Safety Rules*, and *Engineering Manager System* accompanied by the development of competency standards exclusively for the *Engineering Manager* is considered to yield the most effective output.

There was a comment from the Indonesian side that newly developed competency standards at least formally need to maintain continuity with the existing competency standards. Following this, the JICA Study Team has set up a basic policy for the Study to first develop a systematical structure of the required competencies for the *Engineering Manager* based on Japan's Chief Engineer system, to gain the Indonesian site's consensus step by step, and then to work together in transplanting this into a format that will comply with the Indonesian side's request. There were also comments that the qualification of *Engineering Manager* should be provided

separately among power generation, transmission, and distribution, and that the competency standards should be developed with more emphasis on the understanding of practical skills.

According to MEMR, the tasks for completing the competency standards for the *Engineering Manager* will be taken over by the Indonesian side after the completion of the JICA Study because it will still take considerable time (a year or more) for consultation with stakeholders in order to gain consensus on the details. Further, there are also other miscellaneous tasks that would be left remaining for the MEMR staff after the completion of this Study, such as the numbering of the listed items and establishing links between the existing competency standards. Therefore, a considerable volume of tasks needs to be conducted by the Indonesian side after the hand-over from the JICA Study Team. Careful consideration is needed to determine how to transfer the JICA Study Team's output to the Indonesian counterpart so that the workload of the Indonesian side can be mitigated.

## Chapter 6 Development of National Safety Requirements

### 6.1. Basic Concept of National Safety Requirements

#### 6.1.1. Significance of National Safety Requirements

“MEMR Ministerial Decree on Electrical Facilities (Ministerial Decree)”(No.45/2005, No.46/2006), which is referred to as “Ordinance on electrical safety” in the “Government Regulation on Power Supply & Utilization (Government Regulation)” (No.10/1989, No.3/2005), stipulates the procedures of inspection, and touches on how electrical facilities should be maintained in order to secure safety. Besides, the detailed specifications for facilities installation have been established such as the SNI or IEC etc. However, the SNI etc. do not provide a conceptual background on how the facilities should be installed and maintained.

Therefore, the JICA study team established *National Safety Requirements* as the super ordinate concept for the precondition to stipulate quantitative specifications such as SNI.

By clarifying how the facilities should be installed and maintained to be safe in *National Safety Requirements*, specifically, the criteria of inspections, which mentioned only items in the aforementioned “Ministerial Decree”, will be indicated. Further, for the area that has not developed SNI, a principle that all electrical facilities should follow will be indicated by providing *National Safety Requirements* ahead of SNI establishment.

Moreover, under the present situation, enterprises have various kinds of technical standards respectively, but after "*National Safety Requirements*" implementation, when seeing from a viewpoint of security reservation of power facilities and judging whether it is appropriate, they need to follow same technical standards.

And "*National Safety Requirements*" is also expected to help developing SNI systematically as the super-ordinate conceptual platform to indicate the total to-be framework of SNI.

Therefore it required the deepening and disseminating systematically to stakeholders especially

In addition, in order to adjust easily to technology improvements and to quote other standards such as the international standard or the neutral private agency standard, *National Safety Requirements* do not describe the definite specification of electrical facilities and do describe the performance of facilities in order to stipulate the basic concept for securing the facility's safety. Therefore, *National Safety Requirements* are consistent with existing technical standards

such as SNI.

### 6.1.2. Scope of National Safety Requirements

Japan's ministerial ordinance, which possesses extensive experience in managing safety for facilities, to stipulate technical standards on electrical facilities was primarily referred to in developing *National Safety Requirements*. However, this ministerial ordinance literally targets "electrical facilities" and it excludes power supply facilities that are not defined as electrical facilities while it includes electrical facilities that have little to do with electric power supply.

Power supply facilities related to power transmissions, substations and distribution are mostly defined as "electrical facilities", but some facilities related to power generation, such as dams and channels for hydropower generation and boilers and turbines for thermal power generation have been excluded from the definition of "electrical facilities", and they are instead dealt with in ministerial ordinances to stipulate technical standards on hydropower generation facilities and ministerial ordinances to stipulate technical standards on thermal power generation facilities respectively. Facilities related to electric railway are an example of electrical facilities that have little to do with electric power supply.

Because the objective of this Study is to support MEMR as the counterpart agency in Indonesia, in developing technical standards for electric power supply, and the MEMR agreed that the target of *National Safety Requirements* should cover power supply facilities regulated by MEMR, *National Safety Requirements* are developing in reference to the aforementioned Japan's ministerial ordinances. Power supply facilities that are not defined as electrical facilities are dealt with in the *National Safety Requirements* as follows:

[Hydropower facilities]

- Large dams are under supervision at the Ministry of Public Works (MPW) and the facility authentication in the set-up has made the following assessment of the Dam Safety Committee founded under the MPW. Hence, large dams that are under supervision of MPW, as well as their related facilities, shall not be covered by the *National Safety Requirements*.
- However, regarding the medium-sized and small dams that are out of the scope of MPW's authentication and need to be supervised by MEMR in assuring safety, the materials, strength and structure shall be regulated by the *National Safety Requirements*.

(Note) Dams that are subject to the assessment of the Dam Safety Committee:

- Bank height: 15m or higher, and reservoir capacity: 100,000m<sup>3</sup> or more, or
- Bank height: lower than 15m, and reservoir capacity: 500,000m<sup>3</sup> or more, or
- Others that are designated by the Dam Safety Committee take into account their effects on downstream areas.

[ Thermal power facilities ]

- Among the mechanical facilities that are thermal power-related, boilers, and steam turbines that include geothermal power, gas turbines, internal combustion engines, liquefied gas facilities, gasifier facilities and storage facilities for refuse-derived solid fuels are covered by the *National Safety Requirements*.
- However, in Indonesia, the Ministry of Manpower and Transmigration stipulate the safety rules for welding. Therefore, in order to prevent duplication of the regulation, the welding has not been covered by *National Safety Requirements*.
- Boilers and gasifier facilities have been supervised by both MEMR and the Ministry of Manpower. However, MEMR requested to have them covered by *National Safety Requirements*. Therefore, the JICA study team decided to cover them in *National Safety Requirements*.

[ Renewable Power facilities ]

- Renewable power facilities such as wind power, solar power, and fuel cell facilities are have not been covered in the *National Safety Requirements* so far. Because each facility has their own minimum different technical specifications and standard regulations of which all facilities must comply.
- However, the electrical general provisions for generation facilities are covered by *National Safety Requirements*. Geothermal power facilities should comply with the regulation of thermal power because the facilities are almost same excepting steam wells.

[ Nuclear power facilities ]

- Nuclear Power facilities need special and high level technical requirements compared with other generation facilities. The technical requirements for Nuclear power has been established independently from other facilities in Japan
- The nuclear power facilities for commercial use do not exist in Indonesia so far. Further, the development of technology and law for Nuclear power has been implemented by BATAN and BAPETEN, not MEMR. So these facilities have been not covered by *National Safety Requirements*.



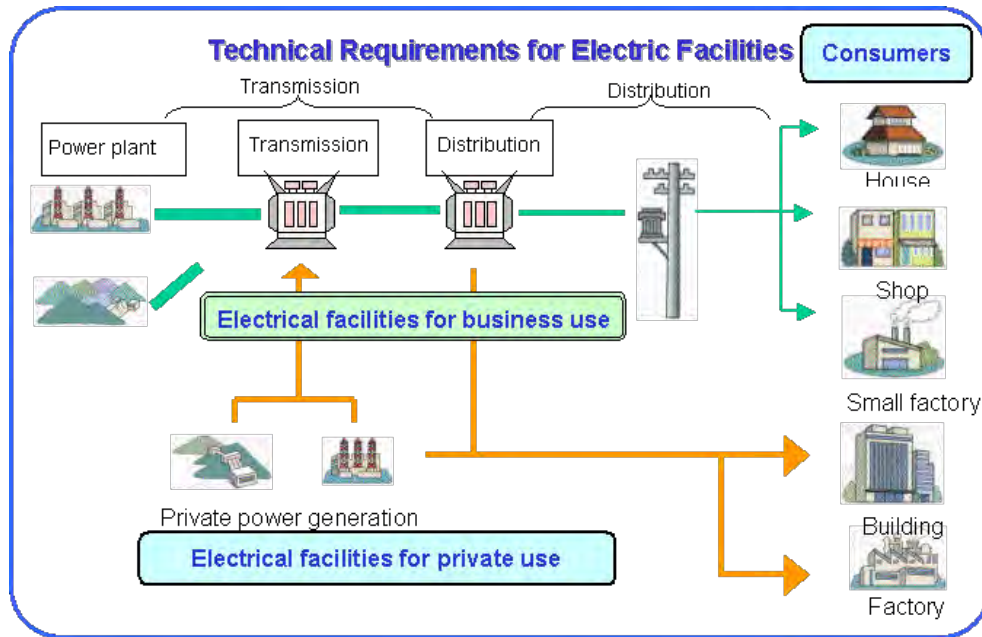


Figure 6.1-1 Scope of National Safety Requirements

## 6.2. Outline of National Safety Requirements

### 6.2.1. System of National Safety Requirements

Japan's technical standard for electrical facilities, that is the reference of *National Safety Requirements*, stipulates the following four safety principles as the foundation for electrical facility safety.

“Safety Principle for Electrical Facilities”

- Prevention of electric shock or fire  
Stipulate measures such as grounding in order to prevent electric shocks or fires.
- Prevention of abnormality and Protective Measures  
Stipulate the fundamental policy for the prevention of abnormalities and protective measures for electrical facilities
- Prevention of electric or magnetic interference in electrical facilities  
Stipulate the prevention of electric or magnetic interference with other objects
- Prevention of obstacles in power supply  
Stipulate prevention of obstacles in the power supply caused by the damage of electric facilities.

The technical standard for electrical facilities in Japan stipulates that the articles for electrical facilities development are based on the aforementioned safety principles. *National Safety Requirements* also apply correspondingly the contents, including the safety principles, stipulated in the technical standards for electrical facilities in Japan. The surroundings or conditions of the electrical facilities, however, are not exactly same as between Indonesia and Japan. The JICA Study Team developed *National Safety Requirements* in consideration of the surroundings and/or conditions of Indonesia.

For example, as mentioned in 6.1.2, the technical standards for electrical facilities, hydropower facilities and thermal power facilities have been established as individual technical standards. The JICA Study Team considered that the *National Safety Requirements* were easily adoptable if that system consisted of each electric power supply business in Indonesia. So under the safety principle, the *National Safety Requirements* stipulate the requirements for the installation of the electric network system and the requirements for generation facilities (general provision). Then the specific requirements for hydropower and thermal power facilities are stipulated under the requirements for generating facilities as depicted in figure 6.2-1.

Each stipulated item was also developed reflecting the comments and opinions at the workshop for the *National Safety Requirements* held on the 4<sup>th</sup> survey, all seminars and meetings at each survey. The comments from the Indonesian side and revised status will be described in 6.2.2.

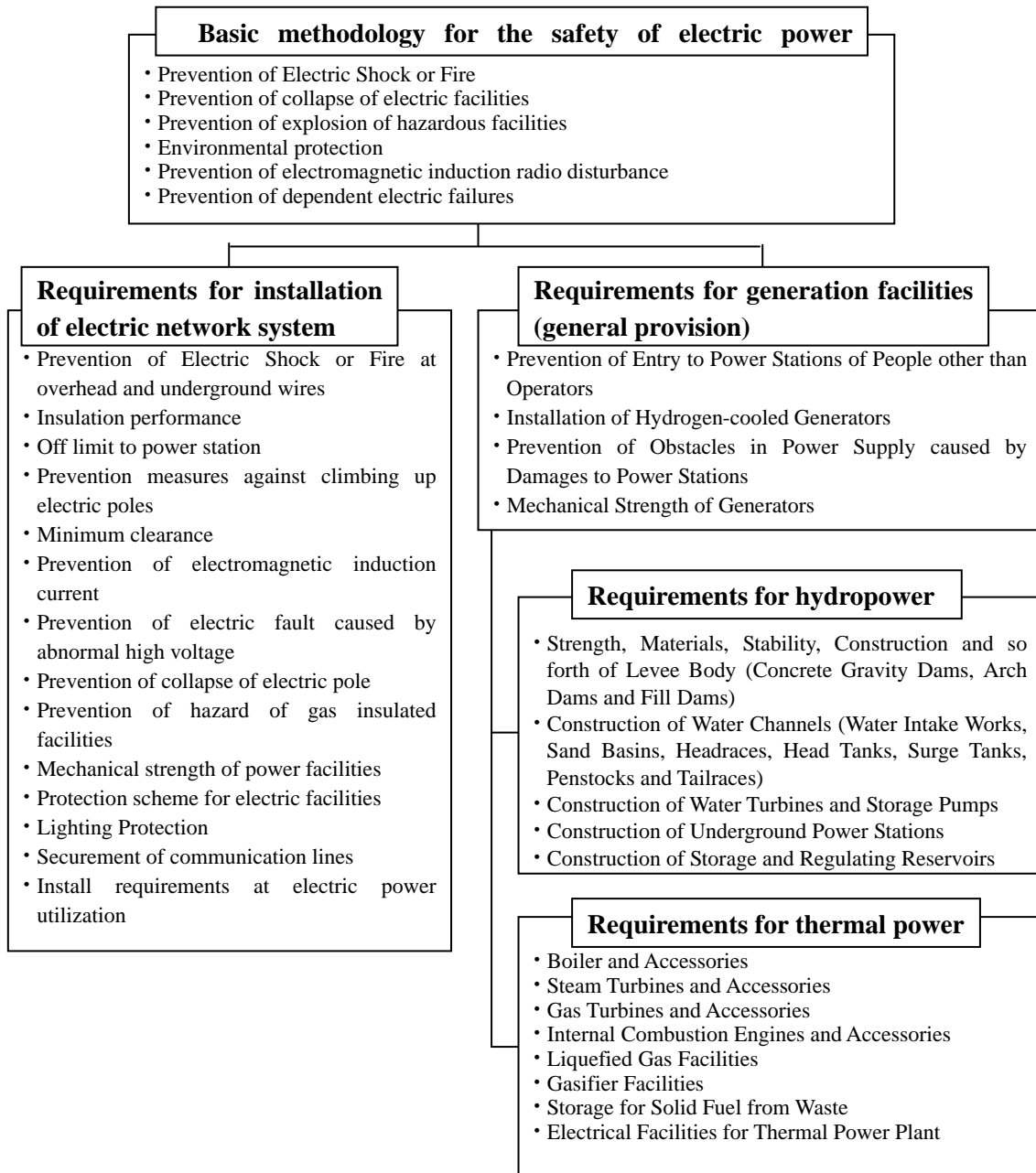


Figure 6.2-1 Structure of National Safety Requirements

### 6.2.2. Structure of National Safety Requirements

The *National Safety Requirements* proposed by the JICA Study Team consist of two parts with 153 articles. Part 1 describes the purpose and safety principles etc. and Part 2 describes the technical requirements for power network facilities, generation facilities, hydropower facilities



## **Chapter 6 Development of National Safety Requirements**

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and thermal power facilities. The scope of application for each facility has been defined based on the results of the discussion with MEMR considering the scope of inspection under MEMR.

## Chapter 7 Safety Management Based on *Safety Rules System*

### 7.1. Basic Concept of *Safety Rules System*

#### (1) Need for *Safety Rules System*

Japan's Electric Utility Industry Law requires power utilities to comply with the following three basic requirements for ensuring the safety of electrical facilities.

- |   |
|---|
| <ol style="list-style-type: none"><li>(1) Obligation of conformance to the Ministerial Ordinance for Determining Technical Standards for Electrical Facilities</li><li>(2) Nomination of a Chief Qualified Engineer</li><li>(3) Establishment, notification to the regulatory agency, and compliance of <i>Safety Rules</i></li></ol> |
|---|

The “*Safety Rules*” as mentioned in (3) are the basic policies governing business operations for ensuring the safety, which should be developed and notified to the government by each power utility.

The relations among these three requirements have been recognized as follows:

The *Ministerial Ordinance for Determining Technical Standards* are conceptual provisions for securing the safety of Electrical Facilities, while the *Safety Rules* are a power utility's internal rules governing its operational tasks to ensure the safety, and *Chief Qualified Engineers System* is a scheme to ensure a power utility's human capacity to implement its operations in accordance with these two system for securing the safety.

It is generally accepted that the combination of these three pillars greatly contributes to the achievement of high-security and high-reliability of electric power supplies in Japan.

In Indonesia, the PLN and IPPs have already established internal regulations and/or guidelines/manuals concerning construction, operations and maintenance for their electric power facilities, while the government has not developed such laws and regulations stipulating organizational structures and operational procedures of the power utilities for securing their facilities' safety.

As mentioned above, the JICA Study Team has proposed *National Safety Requirements* and the

*Engineering Manager System* to the Indonesian side for securing the safety of Electrical Facilities. From the facilities' perspective, the *National Safety Requirements* are to stipulate basic Technical Standards for electrical facilities. From the aspects of practical business, the *Engineering Manager System* is to stipulate that a power utility is obliged to nominate *Engineering Manager* as an overall supervisor for ensuring the safety of its electrical facility in conformity to *National Safety Requirements*. Here, in addition, also in Indonesia, from the viewpoint of ensuring the safety of electric power facilities, it is important for the Government to develop its regulations stipulating that a utility should develop its own basic rules or *Safety Rules* that it should follow to secure the safety of its power facilities in alignment with these rules, aimed at ensuring appropriate construction, operations and maintenance of its power facilities in conformance to *National Safety Requirements*.

In the event of introducing the *Engineering Manager System* mentioned in Chapter 8, each utility needs to notify the government where and how *Engineering Manager(s)* would be posted in the utility's organization. Since *Safety Rules* also play a role in clearly defining a utility's safety management system and stipulating assignments and tasks of the *Engineering Manager*, *Safety Rules* are closely related to the *National Safety Requirements* and *Engineering Manager System*, and are expected to work as one of the important pillars in supporting the safety management system for both the government and the utilities.

## **(2) Outline of Safety Rules System**

### **[Objectives of Safety Rules System]**

The objectives of the *Safety Rules* System are to maintain and improve the safety of electrical facilities secured by the utilities. The *Safety Rules* are basic rules governing construction, operation and maintenance procedures for securing the safety of electrical facilities in conformance to *National Safety Requirements*. The *Safety Rules* consist of the following two main rules: 1) Organizational structures to secure the safety of electrical facilities, including the positioning of Engineering Managers and assignment of duties, 2) basic rules of operational procedures for securing the safety of electrical facilities. Each utility is obliged to submit *Safety Rules* to the government.

### **[Preparation of Safety Rules]**

The JICA Study Team is proposing that *Safety Rules* should be prepared by each power utility, in principle. The reason is as follows.

- 1) Given that the *Safety Rules* are basic rules governing construction, operations and

maintenance procedures for each utility to secure the safety of electrical facilities, *Safety Rules* should be prepared based on each specific facility and operational rules. Therefore, it is more rational that *Safety Rules* would be prepared and submitted to the government by each power utility owning different electrical facilities than that *Safety Rules* be provided by the government as across the board regulations.

- 2) PLN and large-scale IPP have already established detailed private manuals concerning their electrical facilities' operation. Therefore, they can refer to their own private manuals when preparing *Safety Rules*.
- 3) Organizational structures to secure the safety and basic rules of operational procedures of which *Safety Rules* consist as the two main rules should be arranged appropriately based on technical innovations and changes in business environment. Therefore, it is more suitable that *Safety Rules* are prepared by each utility rather than by the government.

#### **[Positioning of Safety Rules]**

It is considered that the stipulations of *Safety Rules* prepared by each power utility refer to the legal obligation of submitting *Safety Rules* to the government. This allows the government to be able to supervise the safety. For instance, the government can order a non-compliant utility to improve its business practices based on the *Safety Rules* as legal grounds.

#### **[Separation of Responsibility between the Government and Utilities by Safety Rules]**

*Safety Rules* define the separation of the roles and the responsibilities between the government and power utilities as follows.

The government establishes *National Safety Requirements* in order to prevent the electrical facilities from creating any danger or obstacles to public safety and oblige the utilities to secure the safety of their electrical facilities in conformance to *National Safety Requirements*. Furthermore, the government obliges the utilities to report the accidents supervise that the facilities conform to *National Safety Requirements* by the statutory site inspection. The government can order the utility who secures the safety insufficiently to improve the way of business. Further, the government can order the utility to amend *Safety Rules* in the event that the descriptions are insufficient for ensuring safety.

## **7.2. Structure of Safety Rules**

The JICA Study Team proposes that the following items be included in the *Safety Rules*.

- I. Organizational structure to secure safety
  - I .1. Organizational structures
  - I .2. Scope of work of *Engineering Manager*, his/her position in the organization
  - I .3. Job description of staff engaged in securing safety
  - I .4. Safety education of employees
- II. Basic policies governing operation to secure safety
  - II .1. Construction, operations and maintenance for the safety of electrical facilities
  - II .2. Inspection for safety of electrical facilities
  - II .3. Records on safety of electrical facilities
  - II .4. Accident report and periodical report on safety of electrical facilities

*Safety Rules* consist of the two main items. One is an organizational matter and the other is an operational matter. The outline of each item is as follows.

### **[I.1. Organizational structures]**

This item requires that the utility must build organizational structures to conform to the relevant regulations and *Safety Rules* for securing the safety of construction, operations and maintenance. In this item, each utility must indicate the management's responsibilities pertaining to securing safety with an organizational chart and provide scales of organization, positioning and the chain of command appropriate for each organization to fully execute his role and responsibility under the plan framed by the president.

### **[I.2. Scope of work of *Engineering Manager*, his/her position in the organization]**

This section stipulates that each facility is obliged to nominate the appropriate number of *Engineering Managers* according to the range of his business. The *Engineering Manager*, who is obliged to supervise so that each organization takes its roles and responsibilities appropriately to secure the safety of electrical facilities, must instruct the employees on general security operations.

### **[I.3. Job Description of Staff engaged in Securing Safety]**

This section stipulates that the manager of each organization is obliged to instruct subordinates and low-ranking organizations and communicate to relevant organizations, and general staff is obliged to obey high-ranking person's instruction for clarifying the job responsibility of each staff engaged in securing safety definitely.



#### [I.4. Safety education for employees]

This section stipulates that a utility is obliged to educate employees on the following matters for securing safety.

- Compliance with relevant laws and regulations, and *safety rules*
- Skills and knowledge regarding the facilities' safety
- Measures against accidents and training

#### [II.1. Construction, operation and maintenance for safety of electrical facilities]

*Safety Rules* are placed as the superordinate rule over the in-house manuals of each power utility and the items that are requested to be included in *Safety Rules* are only described in a general manner. In other words, the notification of detailed down-to-earth descriptions to the Government are not required, whereas the in-house manuals of a power utility are expected to provide practical and ordinary descriptions.

The items requested to be included in the *Safety Rules* are as follows.

- Measures to confirm to the conformity of facilities to *National Safety Requirements* after and during the facilities' construction
- Measures to secure the facilities' safety during operations
- Intervals and items for patrol and inspection to maintain the conformity of facilities to *National Safety Requirements* and prevent accidents
- Measures against the facilities' accidents
- In-house manuals for the facilities' construction, operation and maintenance

#### [II.2. Inspection for safety of electrical facilities]

Each power utility is required to comply with the laws and regulations concerning inspection, and inspect facilities in conformance with National Safety Requirements. The items requested to be included in the *Safety Rules* are as follows.

- Procedures and documentation of inspection
- Organization of inspection and duty of *Engineering Manager*
- Preservation of records
- Staff education and third party management

#### [II.3. Records on safety of electrical facilities]

In order for the third party to judge a utility's safety procedures, the JICA Study Team proposes that the following items concerning the records are requested to be included in the *Safety Rules*.

- Construction and inspection

- Patrol and inspection
- Operation
- Accident
- Education for the staff
- Procedures concerned with the record-keeping and preservation of the above items

#### **[II.4. Accident report and periodical report on safety of electrical facilities]**

The reporting has been divided into two categories, the accident report and the periodical report. Under Indonesia's current status, there are no laws and regulations concerning the accident report. However, the accident report needs the government to supervise the utility's work of securing the safety and the government can achieve the improvement of electrical facilities' safety and the prevention of the similar accidents through an analysis of the accident report. The JICA Study Team requests that the following items concerning the accident report be included in the *Safety Rules*.

- Death or injury from electrical shock
- Fire due to an electrical disturbance
- Damage of the main electrical facilities
- Serious accident causing power failure over wide area

In order for the utilities to report the aforementioned accident to the government immediately and sufficiently, the JICA Study Team also requests that the items concerning the aforementioned documentation and management of the records concerning the above accidents along with the reporting procedures be included in the *Safety Rules*.

On the other hand, a periodical report is to put the accident records in order by a certain period. The accident reports contribute to the qualitative analysis, and the periodical reports contribute to the statistical analysis.

## Chapter 8 Establishment of the *Engineering Manager System*

### 8.1. Basic Concept of the *Engineering Manager System*

#### 8.1.1. JICA Study Team' s Proposal on the *Engineering Manager System*

The development of competency standards for the engineers on a management level (NQF level 4 or higher) was one of the main objectives of technical assistance that the Indonesian government had initially requested to the Japanese Government. In discussing the scope of work agreed upon between the Japan International Cooperation Agency (JICA) and the Indonesian Government in October 2008, the Japanese side will come up with a request to develop the competency standards by referring to the qualification system of Japan's Chief Electrical Engineer system (1<sup>st</sup> – 3<sup>rd</sup> Grade) which is one of the main backbones for securing the safety of the electric facilities in Japan's electric power sector.

The power sector of Indonesia has been shifting from the monopoly of PT PLN to the diversity of the power utilities with a functional segmentation of the PT PLN and IPP's. Following this observation, the JICA Study Team has come to a conclusion that it is beneficial for the power sector in Indonesia to clearly and legally identify the responsibility of the safety management of each electrical facility as shown in Figure 8.1-1. The JICA Study Team proposed to the Indonesian counterpart, i.e. MEMR, the conceptual outline of *Engineering Manager System* based on the Chief Electrical Engineer system in Japan, which was accepted by the Indonesian side.

As explained in Chapter 5, the JICA Study Team presented three options regarding the direction of the Study to the Indonesian counterparts for discussion in the 3<sup>rd</sup> Field Study in Indonesia, and agreed that the 1<sup>st</sup> option would be adopted, in which the introduction of the *Engineering Manager System* would be prioritized and competency development would be focused only on the technical aspects that are conducive to the *Engineering Manager System*. Furthermore, the development of NQF levels 4-6 would be conducted by the Indonesian side afterwards by referring to the results of the Study. This agreement was approved by the Steering Committee dated 3<sup>rd</sup> August 2009. On 5<sup>th</sup> August, the JICA Study Team convened the 2<sup>nd</sup> Seminar inviting relevant persons in the power sector in Indonesia, and presented a conceptual outline of the *Engineering Manager System*, which was positively accepted by the participants.

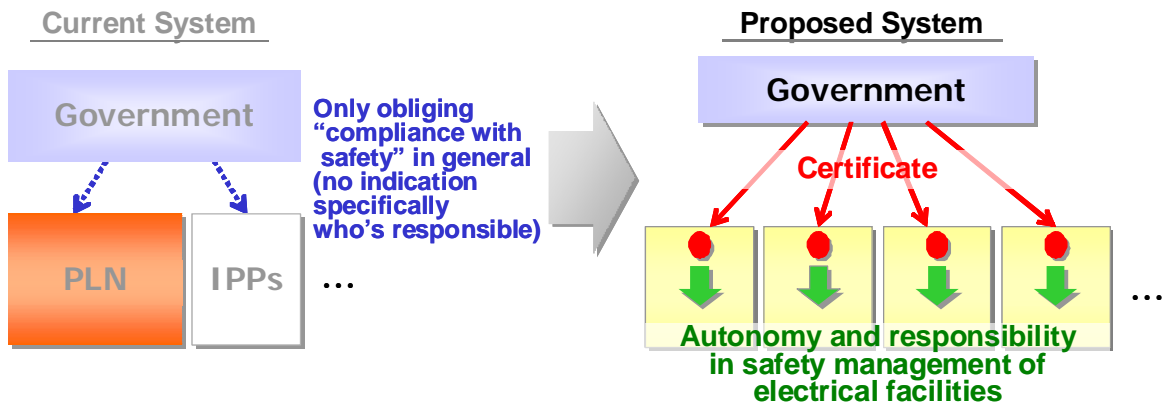


Figure 8.1-1 Image of proposed *Engineering Manager System*

### 8.1.2. Outline of Engineering Manager System

The proposed outline of the *Engineering Manager System* is shown already in Figure 8.1-2. The details about *Engineering Manager System* are described in the following.

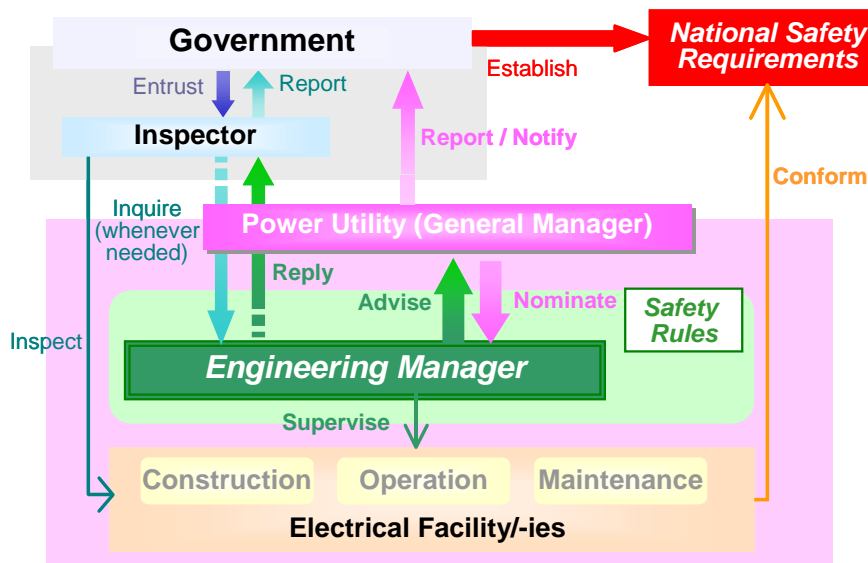


Figure 8.1-2 Safety Management Based on *Engineering Manager System*

#### [Objectives of *Engineering Manager System*]

To nominate a responsible person for supervising and comprehensively managing the safety in construction, operation and maintenance of the electrical facilities and to clearly identify his/her legal status, responsibility, and discretion in an organization for securing the safety of electrical facilities.

**[Safety Management of Electrical Facilities]**

*Engineering Manager* shall hold extensive responsibility for the safety management of the facilities. Compliance with National *Safety Requirements* needs to be noted in carrying out the tasks for safety management.

**[Confirmation of the Compliance Activity in accordance with *Safety Rules*]**

The *Engineering Manager* shall assure whether persons engaged in construction, operation and maintenance are carrying out their tasks in compliance with *Safety Rules*. How *Safety Rules* is given were given their legal status is explained in Chapter 7.

**[Report to the Government (Authority)]**

The *Engineering Manager* shall represent the power utility as the counterpart for the Inspector entrusted by the Ministry, and have accountability for the status of electrical facilities in his/her jurisdiction. The *Engineering Manager* shall report to the Ministry in the event that accidents such as electric shock, fire, or blackout in relation to the facilities occur.

**[Notification of *Engineering Managers*]**

When the *Engineering Manager* is nominated, replaced or dismissed, the power utility shall immediately notify this to the Ministry.

**[Qualification of *Engineering Manager*]**

*Engineering Manager* shall attain the necessary qualification before he/she is nominated by the power utility.

**8.1.3. Allocation and Positioning of *Engineering Manager* System**

Since Electricity Law No.30, 2009 has been enacted in September 2009, the legal position of the *Engineering Manager* in detail will be legislated in Governmental Regulations or the Ministerial Decree, which will be stipulated around 2010, based on a proposal from the JICA Study Team.

Even if the authority and responsibility of the *Engineering Manager* are legally defined, the allocation of the *Engineering Manager* in the organizational structure of a corporate entity is at the discretion of the Power Utilities. A typical indication is that one *Engineering Manager* has been appointed in one Business Unit, such as one Power Plant, one Regional Transmission

Office or one Regional Distribution Office, in accordance with the current situation of existing Power Utilities.

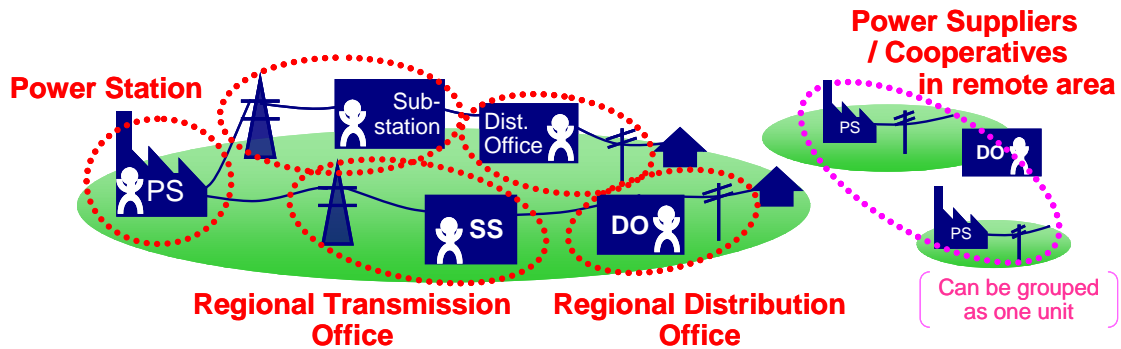


Figure 8.1-3 Allocation of *Engineering Manager*

Even if the authority and responsibilities of the *Engineering Manager* are legally defined, the positioning of the *Engineering Manager* in the organizational structure of a corporate entity is also at the discretion of the Power Utilities.

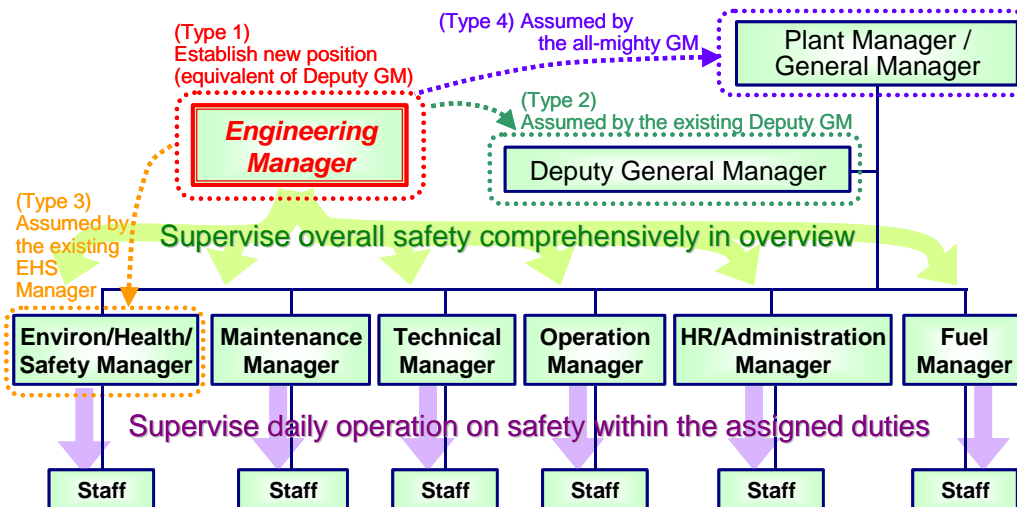


Figure 8.1-4 Positioning of *Engineering Manager*

## 8.2. The Tasks and Responsibilities of *Engineering Managers*

During the 3<sup>rd</sup> Field Study in Indonesia, the JICA Study Team and the Indonesian counterparts have discussed an overview of the proposed *Engineering Manager* system and agreed on the development of this system. Then the Study moved on to the next step to discuss the details regarding the tasks and responsibilities that the *Engineering Managers* should assume.

The following is an outline of the tasks and responsibilities of the *Engineering Manager*, which was prepared by the JICA Study Team for discussion with Indonesian counterparts and stakeholders.

- I. Nomination of Engineering Manager
  - I-1. Obligation to nominate Engineering Manager
  - I-2. Certification of Engineering Manager
- II. Tasks and Responsibilities of Engineering Manager
  - II-1. General Tasks on Safety Management
    - II-1.1 Development of Annual Activity Plan on Safety Management
    - II-1.2 Supervision on Submitting Documents of Application and/or Notification to the Authority
    - II-1.3 Supervision and Assessment of *Safety Rules* and Manuals
    - II-1.4 Planning and implementation of Safety Education, and Supervision of Educational Programs on Safety Management
    - II-1.5 Attendance to Meetings Related to Safety Management
  - II-2. Tasks Concerning Construction of Facilities
    - II-2.1 Supervision of Facility Construction Plan
    - II-2.2 Assessing the Conformity of Construction Designing to *National Safety Requirements*
    - II-2.3 Site Investigation During Construction Works
    - II-2.4 Inspection Before Commissioning
  - II-3. Tasks Concerning Operation and Maintenance of Facilities
    - II-3.1 Assessment of the Condition of Facilities in Operation (Site Investigate)
    - II-3.2 Assessment of Safety Management
    - II-3.3 Supervision of the Revision of Site Patrol
    - II-3.4 Measures against abnormalities and/or accidents/troubles
    - II-3.5 Attendance at Mandatory Onsite Inspection Carried Out by the Inspector
- III. Penalties
  - III-1. Penalties Imposed to Engineering Manager in Case of Violating Laws and Regulations
  - III-2. Penalties Imposed to Power Utility/Power Generation Entity

## Chapter 9 Development of Competency Standard for *Engineering Managers and Qualification System*

### 9.1. Required Competency for Engineering Manager

JICA Team members conducted consultations such as seminars, steering committees and workshops with the relevant counterparts and provided the Indonesian side with proper assistants for developing Engineering Manager System. To be specific, JICA Team determines the appropriately required competencies for the Engineering Managers based on the Japanese Electric Chief Engineering System and the JICA Team developed the suggestions for the competency standard format such as the competency unit title and its description of the Indonesian power sector during the fifth site survey.

In sixth site survey, the JICA Team revised and restructured their proposed competency standards as a result of the Indonesian additional requests and made efforts to support the developed competency element that has been developed to define the contents of the qualification.

The Indonesian side will evaluate the detailed terms of performance and the level of competency using JICA Team's suggestions as reference and finally the Indonesian counterparts will complete the Competency Standards of the Engineering Manager by the end of 2010.

#### 9.1.1. Basic Structure and Evaluation Index for Competency Standard

The Engineering Manager in Indonesia should be classified into five categories from an organizational management perspective and the types of power facilities as described in Fig9.1-1. In addition, hydro power facilities are separated into two roles, both Civil and Mechanic and Electric based on their roles. Transmission and substation facilities are dealing with the same organization and these two facilities should be one category.

The qualifications should be provided to each category after introducing this system. The JICA Team has proposed two step screening processes. The first step is the "Basic Competency" required technical background and the basic knowledge and the 2nd step are the skills related to specific facilities. These have been divided into "Construction", "Operations" and "Maintenance".



The most appropriate organizations for assessing these competencies are existing certification bodies that already possess the know how to evaluate competency and issue the licenses. For example, the certification bodies assess their competencies of the candidate via a written examination, a verbal interview, relevant experience and academic background.

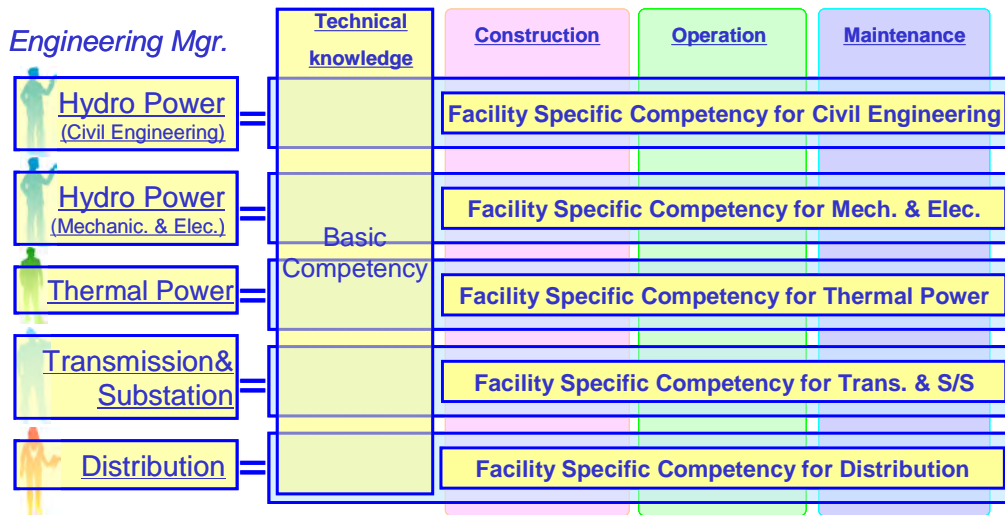


Figure 9.1-1 Competency Index for evaluation of Engineering Manager System

(1) Basic Competency

Basic competency is a common competency regardless of any of the five types of facilities. Its capability is a basic knowledge of the facilities. The candidates need to take an examination, in particular, the academic knowledge of electricity, reporting to authorities, training of staff, planning of construction O&M and compliance with the safety rules.

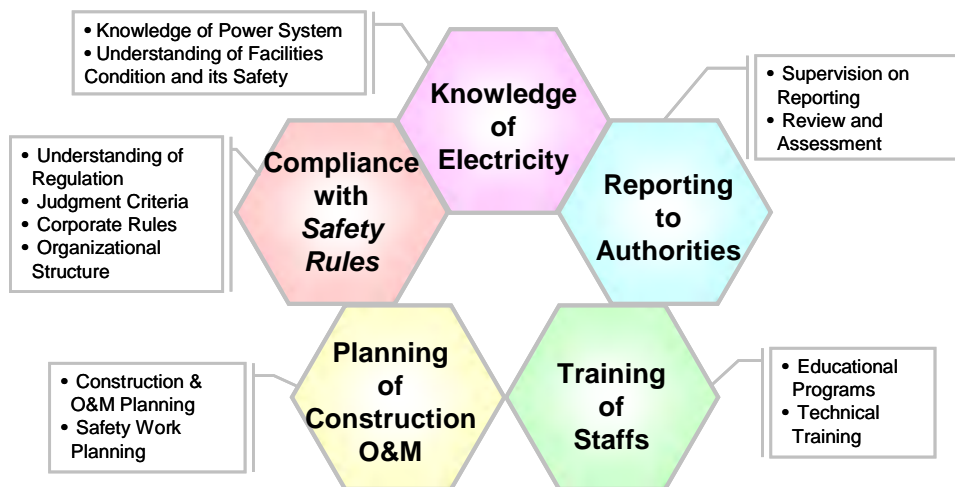


Figure 9.1-2 Five elements for Basic Competency

**(2) Facility Specific Competency**

The next step to becoming an Engineering Manager is to obtain the technical requirements for Engineering Manager as the capabilities for specific facilities. These capabilities are classified into three groups, “Construction” “Operations” and “Maintenance” in each of the five facilities which totals 15 fields in all. As the result of the discussion with DGEEU, the JICA Team has revised and restructured these fields to be more specific and detailed. The revised fields in these three groups are as follows.

- Construction : 「Planning • Design」 「Construction Works」
- Operation : 「Power Supply」 「Restoration of Facilities」 「Operating Management」
- Maintenance : 「Field Inspection • Patrol」 「Maintenance Works」

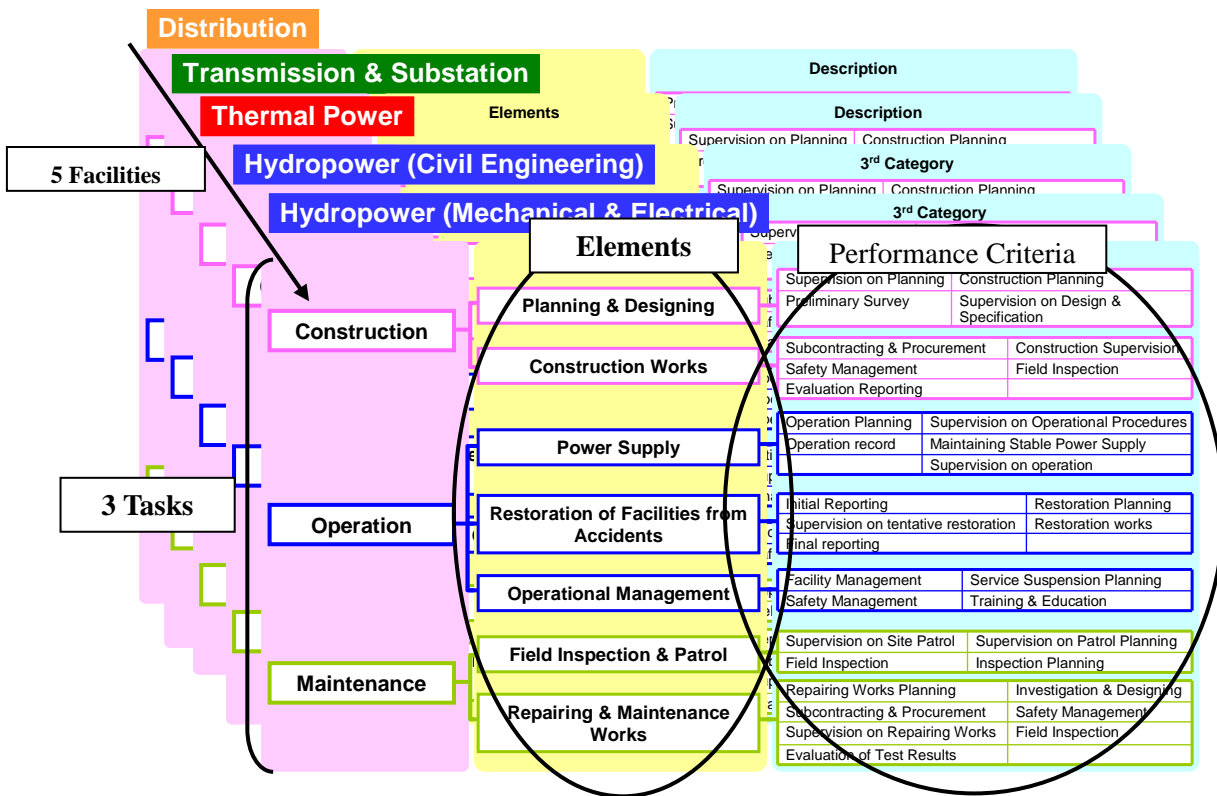


Figure 9.1-3 Structure of Facilities Specific Competency

**9.1.2. Development of Competency Unit format**

It is necessary for the JICA Team to classify the items and revise the expressions on the Indonesian format according to additional requests. The Indonesian side needs to have a discussion with the stakeholders in order to introduce it smoothly and to validate the legislation of the proposed system in the Indonesian legal system.

The JICA Team held a discussion regarding the legislation process during the sixth visit after having achieved basic acceptance of the proposed system. Further, the JICA Team accepted the requests from DGEEU and revised the proposed system to match the Indonesian format.

The Indonesian side of the DGEEU will review JICA’s proposed format in the technical team established in February and will hold a consensus forum with the stakeholders. The Indonesian side DGEEU will add other components such as a parameter of unit competencies and evaluation guidance in order to establish all the contents of the competency standard. Further, it will be legislated as the official competency standard after the Minister of MEMR approval.

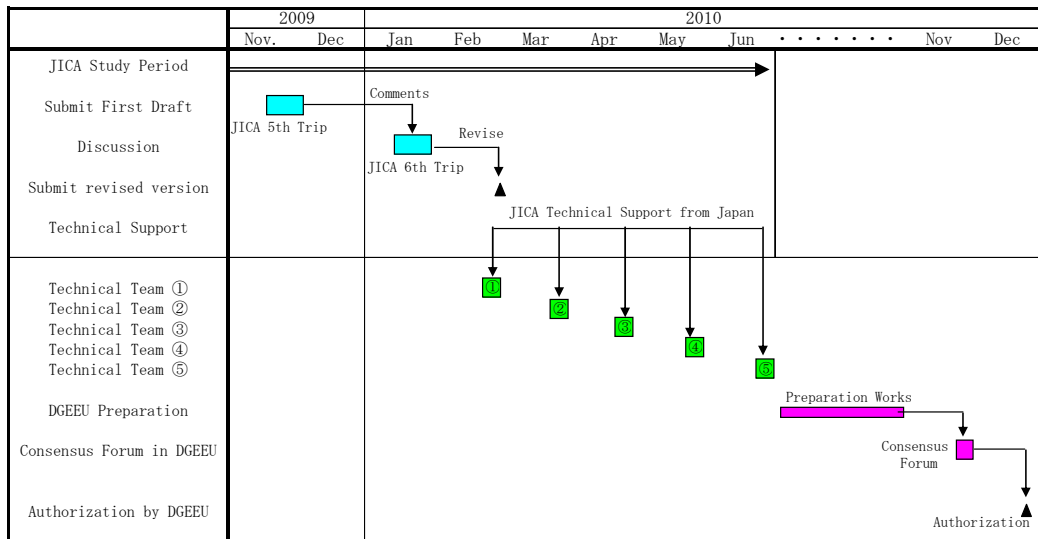


Figure 9.1-4 Developing Schedule for Competency Standard of Engineering Manager

## 9.2. Qualification and Licensing

In considering what type of organization would be the most adequate, it is best to utilize existing resources to a maximum, i.e, four existing Certification Bodies, IATKI, GEMA PDKB, HAKIT or HATEKDIS. The reasons are as follows;

- Basically it is ideal for DGEEU to directly conduct certification operations, but DGEEU should pursue reasonableness by entrusting certification operations to other organizations and then exercise its overall supervision via monitoring or directing certification bodies to improve the quality of certification operations.
- The existing Certification Bodies have so far conducted certification operations on the NQF level 1 to 3 for Electrical Technicians and have compiled enough experiences and

knowledge about it.

- Four Certification Bodies have adopted a flexible operational style so as to fit the necessary system by hiring experienced persons from within the electricity sector and related scholars ,whenever they necessary, as temporary assessors, minus hiring them on a regular basis. Therefore, they will be able to flexibly expand their business scope even to the Engineering Managers qualification.
- When Certification Bodies hire assessors, those bodies evaluate the candidates for assessors and then hire them. This means that existing Certification Bodies possess enough competencies to judge and evaluate experienced persons with an abundant work history and much experience and whose levels correspond to designated management levels.

As for the actual qualification operation, it is considered that there might be no confusion or trouble if the performance criteria of Competency Standards for Engineering Managers are properly applied on the basis of the current methodology for evaluating the assessors.

In the next place, a licensing system is referred. Further, the licenses of Engineering Managers who correspond to one of the following conditions should be issued from the Minister of Energy and Mineral Resources.

- (a) Those that pass the qualification test administered by Certification Bodies. Any person is eligible for test admission
- (b) Those who have an academic history or licenses, and work experiences, designated in the Ministerial Decree
- (c) Those who are accredited by the Minister of Energy and Mineral Resource as persons who have corresponding or superior knowledge and competences to (a) or (b)

To meet transient periods for the adoption of the Engineering Manager System, it is necessary to use the “Deemed Qualification” provisionally. Licensing by (c) is a supplementary rule that enables them to go through such a transitional situation. Details have been described in the next clause.

### **9.3. Preparation for the adoption of the System (Future Direction)**

It is the most ideal way to complete the nomination and allocation of Engineering Managers in all the sites in Indonesia until enforcement date of the Engineering Manager System. However,

taking into account the state of affairs in Indonesia where there are more than 10,000 islands, it is almost impossible to enforce the new system all together in a normal manner. Therefore, it is more ideal to introduce the new system gradually into the Utilities all throughout Indonesia by setting up a transitional period after enforcement of the new system.

In addition, it is also ideal that all Engineering Managers nominated from those who acquired licenses under the qualified conditions (a) or (b); these conditions are proposed in the former clause. However, in order to minimize the confusion and burdens concerning the introduction of the new system, the “Deemed Qualifications” according to the qualification condition (c) should be utilized for the transition period by nominating Engineering Managers from existing workers who are engaged in each Utility’s site. In this regard, after finishing the transitional period, the “Deemed Qualification” should not be used in principle and the supply of Engineering Managers should be based on the application of conditions (a) and (b).

#### **9.4. Human Resource Development for cultivation of Engineering Manager**

The qualification test of Engineering Managers, mentioned in the clause 9.2, would be a very narrow gate for the applicants who have had no work experiences. However, this difficulty should be firmly maintained. Further, because Engineering Managers must take great responsibility for ensuring the overall safety of the Electrical Facilities. Accordingly, it is very difficult for Engineering Managers to exert their competencies minus substantial work experiences. So, the hurdles should be set considerably high so as to announce that the qualification deserves to be recognized as a high and responsible position among not only Power Sector but also the general public.

Taking the aforementioned effects into consideration for human resource development, it can be said that capacity building along with work experiences are the most effective measures. On the other hand, there are no limitations regarding the eligibility for admissions to an examination, i.e., this means that a qualification test is open to anyone who wants to apply for the test. In Japan, many applicants aiming to acquire the licenses of Qualified Chief Engineers are workers in the Power Sectors who have compiled work experiences there. In addition, exam questions are open to the general public after the tests have been administered. Actually many successful applicants pass the tests through continuing self-education, also taking into account the purpose of self-development. Such spontaneous trends of human resource development based on an applicants’ self-motivation, as a consequence, enhance the level of Electrical Techniques and the safety of Electrical Facilities. In Indonesia, such a style of human resource development would

function at a sufficient enough level. Since the utilization of the MEMR Training Centre has also been considered, they should construct a program for human resource development of the Engineering Managers, incorporating a policy of the existing NQF Levels 1 to 3, based on the Competency Standards of Engineering Managers which the JICA Team has proposed.

### **9.5. Provision for maintaining Competency after obtaining licenses**

Engineering Managers are naturally endowed with the duties of good faith in conducting their duties. Therefore, the Minister of Energy and Mineral resource should order those Engineering Managers who violate duties of good faith to hand back their licenses.

On the other hand, as long as the Engineering Managers do not commit a violation, in other words, do not correspond to disqualification causes, their licenses should be maintained as permanent one. It is almost improbable that qualified persons for Engineering Managers would easily lose their management capabilities, which are the result of many years of work experience. As is the nature of the Engineering Managers' qualification, manager capability is primarily tested rather than technical skills. Hence, it may be useless to update the Engineering Managers licenses once every three years like the licenses for NQF Level 1 to 3.

## Chapter 10 Discussion for Institutionalization

### 10.1. Status of Legislating New Electricity Law and Related Regulations

“Electricity law No.30/2009”, which is based on the structural reform of the electric power sector, was legislated in September 2009 mentioned at Chapter 3.1.1.

The Electricity law (No.30/2009) conceptually provides principles, Governmental Regulations and a Ministerial Decree that is subordinated to the Electricity Law provides more in detail in the near future.

The new governmental Regulation is presently being drafted by the DGEEU based on the legislation of Electricity law (No.30/2009) and it follows the Indonesian regulations regarding legislation procedures.

In addition, although 15 related governmental regulations based on the “Electricity Law No.15/1985” existed, the new governmental regulations are expected to be arranged and unified at three regulations covering the following contents as shown in Figure. 10.1-1.

- ① Concerning international cooperation
- ② Concerning building constructor and consultancy firm
- ③ Concerning safety

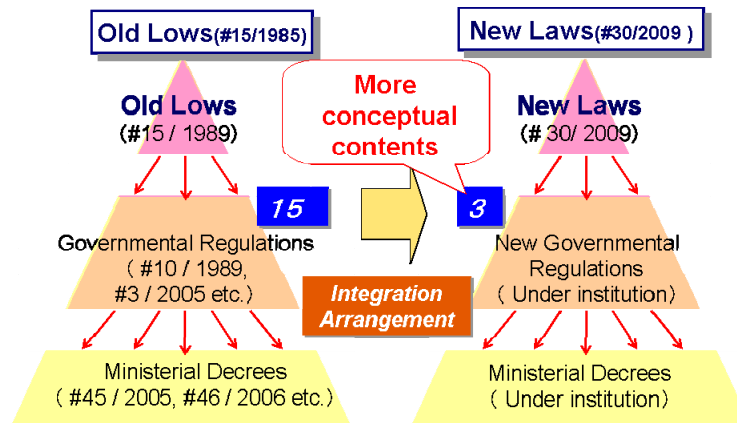


Figure 10.1-1 The comparison of the old and new legal structure

Moreover, with regards to new ministerial decrees, it is expected to be drafted by DGEEU. The main tasks are the modification and addition of the existing ministerial decrees. In addition, it seems that JICA Study Team’s proposal is going to be referred to and reflected in the new

ministerial decrees.

## **10.2. Adoption of the JICA Study Team's Proposal in the New Governmental Regulation**

At present (February 1, 2010), new governmental Regulation are being discussed in detail by DGEEU and it has not been released officially. Therefore, although the details are unknown, according to the contents of the action plan on which it was agreed upon by the Meeting Minutes (February 1, 2010), the adoption of the JICA Study Team's Proposal in the new governmental Regulations is described as follows.

### **10.2.1. National Safety Requirements**

According to the action plan, it seems that the "Safety Principle for Electrical Facilities", which is the contents of "National Safety Requirements" mentioned in Chapter 6, is going to be legislated under new governmental regulations.

### **10.2.2. Safety Rules System**

According to the action plan, it seems that the idea of "Safety Rules System", which is mentioned in Chapter 7, is going to be legislated under the new governmental regulations in order to clearly define the roles of Government and the power utilities regarding safety management on facilities and assure facility management safety.

### **10.2.3. Engineering Manager System**

According to the action plan, it appears that the idea of the "Engineering Manager System", mentioned in Chapter 8, is going to be legislated under new governmental regulations in order to clearly define the personnel responsible for supervising the organizational structure to secure the safety of electrical facilities.

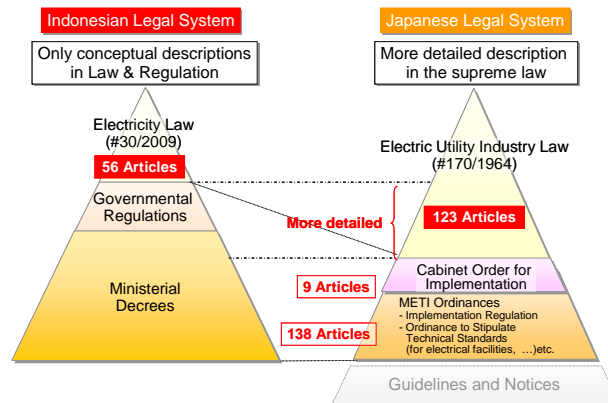
## **10.3. Further Legislation (Next Steps)**

Even if the new "Governmental Regulation on Electricity Supply Business" that has been prepared by MEMR is approved minus any major changes from the current draft and the new



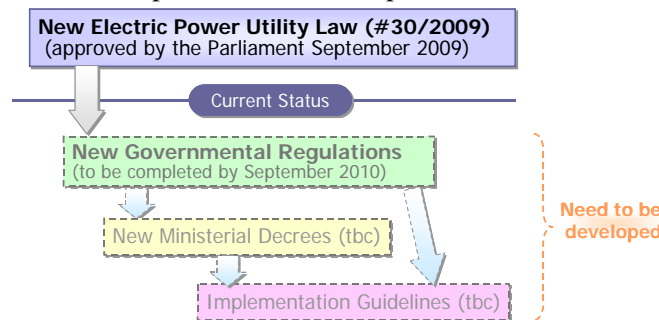
systems are reflected in the new Governmental Regulation as discussed in the previous section, these stipulations in the new Governmental Regulation will simply be a general description with 1- or 2-line sentences each, thus they cannot be a detailed definition of the new systems.

This is partially due to the difference in the legal system between Indonesia and Japan, that is, whereas Japan’s Electric Utility Industry Law consists of 170 articles in total, Indonesian laws and regulations have been formulated with simpler stipulations, with 56 articles in the Electricity Law (No.30/2009). Therefore, it can be assumed that some stipulations that would be included in Japan’s Electric Utility Industry Law might be regarded as too specific and they might not be provided either in the Electricity Law (No.30/2009) or the subordinate Governmental Regulations.



**Figure 10.3-1 Difference in Legal Structure Related to Electric Power between Indonesia and Japan**

Therefore, it is necessary to wait until at least the development of new Ministerial Decrees that will follow after the completion of the new Governmental Regulations for evaluating whether the new systems proposed by the JICA Study Team have been reflected in the new legal structure as effectively functioning systems. According to MEMR, the development of new Ministerial Decrees will be completed after the completion of new Governmental Regulations.



**Figure 10.3-2 Legislation of New Electricity Law and the Plan of Developing Related Ordinances**



## **Chapter 10 Discussion for Institutionalization**

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In order to assure that the institutional design will be made to reflect the JICA Study Team's proposal in the process of developing new Governmental Regulations and the new Ministerial Decrees after the completion of this Study, the JICA Study Team and DGEEU has agreed on the "Action Plan" via the Meeting Minutes (February 1, 2010)

## **Chapter 11 The Way Forward**

### **11.1. “Action Plan” to Be Done by MEMR after the Completion of the Study**

The tasks that the Indonesian side needs to do after the completion of Study have been summarized as the “Action Plan” as seen in Table 11.1-1. The specific descriptions of each individual action are discussed in and from the following Sections 11.2 and after.

The draft of this “Action Plan” was presented by the JICA Study Team to the Indonesian counterpart during the 5<sup>th</sup> Field Study in Indonesia and was discussed intensively during the 6<sup>th</sup>, i.e. the final, Field Study in Indonesia. After the creation of amendments taking into account the opinions of the Indonesian side, the Team Leader of the JICA Study Team and the Director of the Technical and Environmental Regulations of Electric Power of DGEEU, MEMR signed this Action Plan as a part of the Meeting Minutes of the final Field Study.

Table 11.1-1 "Action Plan" to Be Done by MEMR after the Completion of the Study

Subject Group	Subject	Recommended Action	Responsible Division	Period (by when)	Assistance to be made by the JICA Study Team	MEMR's Comments
<b>National Safety Requirements</b>	Legislation of <i>NSR</i>	Completion of the Governmental Regulation	SDEE, SDEIS & SDES	Sep. 2010	Provide relevant provisions in Japanese laws and regulations for reference	JICA Study Team's proposal will be utilized in developing the new Regulation/Decree, though further discussion within MEMR is needed to determine how it will be adopted
		Development of the new Ministerial Decree	SDEE, SDEIS & SDES	Sep. 2010		
		Hosting a forum / seminar / workshop for related stakeholders to share understanding	SDEE, SDEIS & SDES	Sep. 2010	N.A.	
		Distribution of edification brochure (based on the draft prepared by the JICA Study Team)	SDEE, SDEIS & SDES	Sep. 2010	Provide the draft of edification brochure	
	Developing implementation guidelines to supplement <i>NSR</i>	Development of Implementation Guidelines of <i>NSR</i> with more specific criteria	SDEE, SDEIS & SDES	Dec. 2011	Provide Japan's example (e.g. translation of "Kaishaku") for reference	MEMR will develop the implementation guideline by referring to Japan's example
		Completion of SNI/PUIL to cover the entire facilities related to electrical power supply	SDEE, SDEIS & SDES	Dec. 2011	N.A.	MEMR will try accelerating the process of completing SNI/PUIL, though it may be less prioritized than developing <i>National Safety Requirements</i>
<b>Safety Rules</b>	Legislation of Safety Rules	Completion of the Governmental Regulation	SDEE & SDEIS	Sep. 2010	Provide relevant provisions in Japanese laws and regulations for reference	JICA Study Team's proposal will be utilized in developing the new Regulation/Decree, though further discussion within MEMR is needed to determine how it will be adopted
		Development of the new Ministerial Decree	SDEE & SDEIS	Sep. 2010		
		Hosting a forum / seminar / workshop for related stakeholders to share understanding	SDEE & SDEIS	Sep. 2010	N.A.	
		Distribution of edification brochure (its draft is prepared by the JICA Study Team)	SDEE & SDEIS	Sep. 2010	Provide the draft of edification brochure	
	Developing guidelines to specify <i>Safety Rules</i>	Determining the roles of the Government and utilities in developing <i>Safety Rules</i>	SDEE & SDEIS	Sep. 2010	Discuss with MEMR staff based on the JICA Study Team's proposal (to be provided Jan 2010)	To be stipulated in the new Ministerial Decree in consultation with stakeholders
		Developing a detailed guidelines to define the specification of <i>Safety Rules</i> system (as well as providing a template of <i>Safety Rules</i> )	SDEE & SDEIS	Dec. 2011	Discuss with MEMR staff based on the JICA Study Team's proposal (to be provided Jan 2010)	
	Roadmap for full adoption of <i>Safety Rules</i> system	Determine the period and targeted facilities for implementation	SDEE & SDEIS	Sep. 2010	Discuss with MEMR staff to give advices	This item items will be stipulated in the new Ministerial Decree in consultation with stakeholders MEMR expects JICA Study Team to provide example of gradual implementation
	Further expanding the target of <i>Safety Rules</i> as next steps in the future	Discussion for applying <i>Safety Rules</i> system to power users' facilities and captive power	SDEE & SDEIS	After 2011	Provide advices (when needed)	MEMR will study the feasibility of implementing <i>Safety Rules</i> system to power utilization facilities after confirming the effectiveness of this system for power supply facilities MEMR expects JICA Study Team to provide example of applying <i>Safety Rules</i> to power utilization facilities

Subject Group	Subject	Recommended Action	Responsible Division	Period (by when)	Assistance to be made by the JICA Study Team	MEMR's Comments
<b>Engineering Manager System</b>	Legislation of <i>Engineering Manager</i> system	Completion of the Governmental Regulation	SDEE	Sep. 2010	Provide relevant provisions in Japanese laws and regulations for reference	JICA Study Team's proposal will be utilized in developing the new Regulation/Decree, though further discussion within MEMR is needed to determine how it will be adopted  MEMR is ready to coordinate the meetings and distribute the brochure, as far as the budget allows
		Development of the new Ministerial Decree	SDEE	Sep. 2010		
		Hosting a forum / seminar / workshop for related stakeholders to share understanding	SDEE	Sep. 2010	N.A.	
		Distribution of edification brochure (its draft is prepared by the JICA Study Team)	SDEE	Sep. 2010	Provide the draft of edification brochure	
	Developing guidelines to specify <i>Engineering Manager</i> system	Developing a guidelines (templates) to define the roles and responsibilities of <i>Engineering Manager</i>	SDEE	Dec. 2011	Discuss with MEMR staff by referring to Japan's sample	To be stipulated in the new Ministerial Decree in consultation with stakeholders
	Roadmap for full adoption of <i>Engineering Manager</i> system	Determining the period and targeted facilities for implementation	SDEE	Sep. 2010	Discuss with MEMR staff to give advices	To be stipulated in the new Ministerial Decree in consultation with stakeholders MEMR expects JICA Study Team to provide example of gradual implementation
Further expanding the target of <i>Engineering Manager</i> system as next steps in the future	Discussion for applying <i>Engineering Manager</i> system to power users' facilities and captive power	SDEE	After 2011	Provide advices (when needed)	MEMR will study the feasibility of implementing <i>Engineering Manager</i> system after confirming the effectiveness of this system for power supply facilities. MEMR expects JICA Study Team to provide example of applying <i>Engineering Manager</i> system to power utilization facilities	
<b>Technical Competency for <i>Engineering Manager</i></b>	Completion of the list of Competency Units	Completion of the entire list of Competency Units following the receipt of the 1 <sup>st</sup> draft provided by the JICA Study Team	SDEE	Dec. 2010	Provide the 1 <sup>st</sup> draft of the list of Competency Units (from Japan)	MEMR expects the JICA Study Team to provide the draft of entire list of Competency Units
	Taking necessary procedures for authorization	Gaining approval within MEMR	SDEE	Jun. 2011	N.A.	Notification to BNSP is not needed once the competency standard is authorized by the Ministry of Energy and Mineral Resources
	Developing the institutional scheme of certifying <i>Engineering Manager</i>	Determining the entities to undertake certification	SDEE	Dec. 2011	Discuss with the existing certification bodies (when needed)	To be stipulated in the new Ministerial Decree in consultation with stakeholders
		Assisting the aforementioned entities in developing certification system	SDEE	Dec. 2011		
		Concluding an agreement with the aforementioned entities to entrust the certification	SDEE	Dec. 2011	N.A.	
		Establish a section within MEMR to license <i>Engineering Manager</i>	SDEE	Dec. 2011	N.A.	
	Roadmap for applying the certification of <i>Engineering Manager</i>	Estimating the workload for certifying all potential applicants	SDEE	Sep. 2010	Provide advices (when needed)	To be stipulated in the new Ministerial Decree in consultation with stakeholders
		Determining the transitional period before full adoption	SDEE	Sep. 2010	Provide advices (when needed)	
Hosting a forum / seminar / workshop & developing edification brochure (when needed)		SDEE	Sep. 2010	N.A.		

(Note) SDEE: Sub-Directorate of Electricity Engineers (Mr. Arief Indarto)

SDEIS: Sub-Directorate of Electricity Installation and Safety (Mr. Pahala Lingga)

SDES: Sub-Directorate of Electricity Standardization (Mr. Alihudin Sitompul)

## 11.2. National Safety Requirements

### 11.2.1. Legislation of *NSR* and Promotion for Full Adoption

“Government Regulation on Electric Power Supply” under consideration shall be legislated based via the new Electricity Utility Law. The draft of regulations has not yet been disclosed, according to MEMR, there is a description such that “the purpose of regulation regarding the safety of electric power facilities is to achieve the following condition” in the (2) of Article 46 and the condition seems to include firstly the “reliability of the facilities and safety”. Based on this Article, it seems that the “National Safety Requirements” proposed by the JICA Study Team is going to be legislated via Ministry Decree which shall be developed at the next step.

The JICA Study Team is expecting the draft of “Government Regulation”’s to be completed minus any major modifications. The JICA Study Team is also expecting the detailed design of National Safety Requirements to be completed with the works of the related Ministry Decree development right after Government Regulations are approved. During the study period, the Team provides reference information regarding related laws/regulations in Japan.

At the same time of processing Government Regulations and Ministry Decrees, MEMR is kindly asked to proceed with promotion activities among business entities related to the power sector in order to easily introduce National Safety Requirements. For example, it is recommended that a “Forum, Seminar & Workshop” be held inviting the related parties, and it is also believed that a brochure should be provided or distributed in order that the new scheme be understood easily. The draft of the Brochure in the Indonesian language is going to be provided during the 6<sup>th</sup> study visit. Based on the draft of Brochure, it shall be continuously reviewed or revised, and distributed to the related parties even after this Study is completed.

Moreover, at the workshop for promotion of the JICA Study Team’s proposals under the auspices of the MEMR, the stakeholders requested of MEMR that the implementation on National Safety Requirement must be legitimated on level of Government Regulation or Minister Decree in order to enforce to the private sector to ensure observance of laws and rules. The JICA Study Team investigated into the current status of the safety management of electrical facilities and the competency standards in electric power sector in Indonesia, taking into account the status quo of the sector, and then based on the problems observed by the JICA Study Team, three new systems for improving the safety of electrical facilities, namely “National Safety

Requirements”, “Safety Rules”, and “Engineering Manager system” were proposed and finally these proposals need to be institutionalized.

Therefore the basic contents of the “National Safety Requirements” should be legislated as new Governmental Regulation, the detail contents of the “National Safety Requirements” should be legislated as new Ministerial Decrees, and the technical specifications with numerical criteria should be legislated as the guidelines.

### **11.2.2. Developing Implementation Guidelines to Supplement NSR**

Based on the New Electricity Utility Law coming into effect in September 2009, the establishment of “Government Regulation on Electric Power Supply” is presently being consideration. It is expected to have articles in the new regulation so that electric power facilities shall maintain their reliability and safety in the long run as mentioned in 11.2.1. In order for electric power facilities to comply with new regulations, the establishment of technical requirements by way of Ministry Decree or some other form of legislation is necessary. The proposed National Safety Requirements prepared by the JICA Study Team are the fundamental technical requirements based on the basic law / regulations regarding electric utilities in Indonesia.

In Indonesia, the liberalization of electric utility industry is making headway and new business entrants such as IPPs have been entering into the electric utility industry. Even though circumstances where business entrants are entering, electric power facilities shall be installed and maintained in accordance with the regulation/appropriate requirements. As mentioned before, the proposed “National Safety Requirements” have been prepared as conceptual requirements of which any utility or IPPs shall comply with for electric power facility installations. In other words, the “National Safety Requirements” is the common platform for installation and maintenance of electric power facilities in a safe manner.

Since the proposed National Safety Requirements are the conceptual requirements, it only stipulates that electric power facilities should exist for safety reasons. In this view, the JICA Study Team recommends that more detailed guidelines for electric facility installations and maintenance be established that comply with National Safety Requirements.

Based on the idea that National Safety Requirements are the conceptual requirements, in order to apply the requirements efficiently, the JICA Study Team recommends to develop detailed

guidelines for implementation of electric power facility development in accordance with National Safety Requirements. The guidelines shall indicate specific requirements including numerical indications.

The development of such guidelines are expected because it will become policy for fares and appropriate facility developments for all entities and it is also expected that the guidelines enable the appropriate judgment of whether or not electric facilities have been installed in accordance with the National Safety Requirements.

### **11.2.3. Completion of SNI/PUIL**

As mentioned in Chapter 3, the SNI shall be developed based on Government Regulation governing National Standardization. So far, among electric facilities, generation, transmission, distribution, and in-house facilities, the fields of distribution and in-house facilities have been standardized as SNI.

In addition to the field of distribution other fields including generation, transmission, and transformation are expected to develop SNI as soon as possible in accordance with the National Safety Requirements that the JICA Study Team has proposed.

When completing SNI from now on, it is necessary to follow the "national safe requirements" which is conceptual platform to indicate the total to-be framework of SNI. When considering that a part of existing technical standard has not satisfied enough the specification for on "national safe requirements" temporarily, it is necessary to conduct suitable reinforcement for reexamination about an applicable part.

## **11.3. Safety Rules**

### **11.3.1. Legislation of *Safety Rules* and Promotion for Full Adoption**

The legislation of the *Safety Rules* System will be moved forward at the MEMR's initiative during the upcoming Governmental Regulations or Ministerial Decrees, based on the proposal that the JICA Study Team has submitted. During this study period, the Team provides reference information regarding related laws/regulations in Japan.



At the same time of processing Governmental Regulations and Ministerial Decrees, the MEMR is for the promotion of activities to introduce *Safety Rules* System among business entities related to the Power Sector. For example, the “Forum, Seminar or Workshop” organized by MEMR will be held by inviting the related parties, and also the enlightenment brochure will be utilized in order for the new scheme to be understood easily among them. At the 5<sup>th</sup> Seminar of this Study in January 2010, a large amount of the enlightenment brochure in the Indonesian language prepared by JICA Study Team was provided to participants during the Seminar. Even after this study was completed, MEMR will continuously review or revise the enlightenment brochure and distribute them to stakeholders within the Power Sector.

Moreover, at the workshop for promotion of the JICA Study Team’s proposals under the auspices of the MEMR, the stakeholders requested of MEMR that the implementation on Safety Rules must be legitimated on level of Government Regulation or Minister Decree in order to enforce to the private sector to ensure observance of laws and rules.

The JICA Study Team investigated into the current status of the safety management of electrical facilities and the competency standards in electric power sector in Indonesia, taking into account the status quo of the sector, and then based on the problems observed by the JICA Study Team, three new systems for improving the safety of electrical facilities, namely “National Safety Requirements”, “Safety Rules”, and “Engineering Manager system” were proposed and finally these proposals need to be institutionalized.

Therefore the basic contents of the “Safety Rules” should be legislated as new Governmental Regulation, the detail contents of the “Safety Rules” should be legislated as new Ministerial Decrees and the guidelines.

### **11.3.2. Developing Guidelines to Specify *Safety Rules***

In the power sector of Indonesia, deregulations are being introduced step by step for the efficiency of the power sector. From this perspective, it is considered to be effective in the promotion of efficiency and safety enhancement in terms of actual execution which allows a certain degree of discretion up to the utilities.

It is effective for promoting the efficiency and the improvement of safety in such a way that the securing of safety is left up to each power utility’s discretion as much as possible. Therefore, the JICA Study Team proposed the introduction of a *Safety Rules* System in order to clearly define the responsibilities of the government and utilities and maintain the electrical facilities in compliance with *National Safety Requirements* autonomously, and the proposal is widely

accepted by the persons concerned.

For the full adoption of the Safety Rules System defining the roles and the responsibilities of the government and utilities clearly, the MEMR will develop guidelines to assist power utilities in preparing *Safety Rules* of their own consideration of the ability and the situation of the government and utilities.

Moreover, for various reason, when the creation of Safety Rules is difficult by enterprises their selves, relaxation of regulations is necessary like the creation of Safety Rules by similar enterprise associations jointly.

### **11.3.3. Roadmap for Full Adoption of *Safety Rules* System**

In order to introduce Safety Rules System smoothly and surely, MEMR needs to decide on a roadmap for the full adoption of Safety Rules and show the roadmap to the persons concerned. The gradual adoption of the Safety Rules System via prioritizing large-scale power stations which are important in terms of their impact on safety and solving problems at each stage may be considered. In order to promote smooth adoption, the MEMR will also hold seminars to discuss how to install the *Safety Rules* System and schedule with relevant organizations.

### **11.3.4. Further Expanding the target of *Safety Rules* as Next Steps in the Future**

The scope of the *Safety Rules* in this System in this Study covers electric supply facilities such as generation, transmission, and distribution. The discussion on applying the *Safety Rules* System to power user's facilities and captive power needs to be considered as the next step after the completion of this study.

## **11.4. Engineering Manager System**

### **11.4.1. Legislation of *Engineering Manager* System and Promotion for Full Adoption**

The legislation of the *Engineering Manager* System will be moved forward at the MEMR's initiative in the upcoming Governmental Regulation or Ministerial Decree, based on the proposal that the JICA Study Team has submitted. During this study period, the Team provides

reference information regarding related laws/regulations in Japan.

At the same time of processing the Governmental Regulations and Ministerial Decrees, the MEMR is to promote activities in order to introduce the *Engineering Manager System* among business entities related to the Power Sector. For example, the “Forum, Seminar or Workshop” organized by the MEMR will be held by inviting the related parties, and also the enlightenment brochure will be utilized in order for the new scheme to be understood easily among them. At the 5<sup>th</sup> Seminar of this Study in January 2010, a large amount of the enlightenment brochure in the Indonesian language prepared by the JICA Study Team was provided to participants in the Seminar. Even after this study was completed, the MEMR will continuously review or revise the enlightenment brochure and distribute them to stakeholders in the Power Sector.

Moreover, at the workshop for promotion of the JICA Study Team’s proposals under the auspices of the MEMR, the stakeholders requested of MEMR that the implementation on Engineering Manager System must be legitimated on level of Government Regulation or Minister Decree in order to enforce to the private sector to ensure observance of laws and rules, as *Safety Rules*.

The JICA Study Team investigated into the current status of the safety management of electrical facilities and the competency standards in electric power sector in Indonesia, taking into account the status quo of the sector, and then based on the problems observed by the JICA Study Team, three new systems for improving the safety of electrical facilities, namely “National Safety Requirements”, “Safety Rules”, and “Engineering Manager system” were proposed and finally these proposals need to be institutionalized.

Therefore the basic contents of the “Engineering Manager” should be legislated as new Governmental Regulation, the detail contents of the “Engineering Manager” should be legislated as new Ministerial Decrees and the guidelines.

#### **11.4.2. Developing Guidelines to Specify *Engineering Manager System***

The liberalization is processing in Indonesia to make power sectors more efficient in Indonesia, and the power sector of Indonesia has been shifting from the monopoly of PT PLN to the diversity of power utilities with functional segmentation of new entries such as IPP in generation market. Considering the diversification of players, it is important for the power sector in Indonesia to clearly identify the responsibilities of safety management of each electrical facility in legislation.

The concept of the *Engineering Manager*, however, is new to the power sectors in Indonesia. The MEMR will prepare detailed guidelines in order to clarify the roles and responsibilities, for example, based on the following actions.

- The positioning of the *Engineering Manager* in an organization will be illustrated in the guidelines. For example, the appointing of an *Engineering Manager* at each regional business unit or establishing a policy regarding the positioning of the *Engineering Manager* will be described taking into account its own organizational structure and staff capacity, etc.

or

- Stipulated penalty when *Engineering Manager*'s activities fail to comply with *National Safety requirements*.

#### **11.4.3. Roadmap for Full Adoption of *Engineering Manager* System**

Action plans for the *Engineering Manager* is similar to those for *Safety Rules*, because both systems are closely related with each other. The gradual adoption of the *Engineering Manager* System by prioritizing large-scale power stations and solving problems at each stage will be considered. In order to promote the smooth adoption, the MEMR will also hold seminars to discuss how to install the *Engineering* System and schedule with relevant organizations.

#### **11.4.4. Further Expanding the Target of *Engineering Manager* System as Next Steps in the Future**

The scope of the *Engineering Manager* System in this Study covers electric supply facilities such as generation, transmission, and distribution. The discussion on applying the *Engineering Manager* System to power user's facilities and captive power needs to be considered as the next step after the completion of this study.

The following figure is a step by step depiction how the *Engineering Manager* System and *Safety Rules* be adopted. This figure has been developed taking into account stakeholders' comments stating that the values of assets and risks in the event of accidents should be emphasized.

In addition, about the expansion of adoption sector, it is necessary to conduct the hearing of opinion

from the stakeholders and to carry out transition measures, such as preparing a suitable renewal period by mandating. Moreover, about the generating facilities for own use, if sufficient safety is secured, relaxation of regulations is necessary like Engineering Manager System positions can be held by the manager of Safety Work as current system that runs now.

Stage	Hydro	Thermal	Transmi.	Distribut.	Power receiving units on MV or more	Generating Facilities for own use
1st	Capacity with 10MW or more	Capacity with 100MW or more	Java-Bali Islands			
2nd	Capacity with less than 10MW	Capacity with less than 100MW	Major islands other than Java-Bali	Java-Bali islands		
3rd			Small islands	Major islands other than Java-Bali	Java-Bali islands	Java-Bali islands
4th				Small islands	Other islands than Java-Bali	Other islands than Java-Bali

Figure 11.4-1 Image of step by step adoption of *Engineering Manager System and Safety Rules*

## 11.5. Technical Competency for *Engineering Manager*

### 11.5.1. Preparation of Competency Units of *Engineering Manager*

Regarding the aforementioned Engineering Manager System, the clarification of the required competencies for Engineering Manager is necessary for the smooth introduction and steady implementation of this system as well as for establishing their qualifications. Indonesia already has the relevant regulations, the “Ministerial Decree of Energy and Mineral Resources on Competency Standardization for Electrical Workers, No.2052, 2001” in order to realize the Competency Standardization for Electrical Workers. Further, based on these purposes, a fundamental framework has been set up regarding the establishment of “Competency Standards”, training for technical workers and the supervision of certification bodies for Competency Standards.

Under these circumstances, the JICA Team promoted consultation with the DGEEU staffs regarding the introduction of the Engineering Manager System. Further, the JICA Team also proposed the requirements of the Engineering Manager in order to conduct smooth implementation of the system.

These proposed requirements of the Engineering Manager are described in Appendix-4 and have been divided into both one “Basic Competency” and 15 “Facilities Specific Competencies”. The later Facilities Specific Competencies are under the three categories of Construction, Operations and Maintenance in each of the five power facilities.

These competency standards have specific formats, as shown in sample Figure 9.1 4, that has been authorized by DGEEU as a Competency Standard. This format has a competency unit name and cord together with the descriptions of its competency and required knowledge and skill to obtain the qualifications called the “competency element”. These competency elements are the smallest units of the competency have been broken down into General Competencies, Core Competencies and Optional Competencies.

The JICA Team developed the drafts of the competency standard formats and submitted these drafts to DGEEU during the fifth visit. The JICA Team had additional requests from the DGEEU to revise and restructure these competency standards and agreed to revise the format according to the requests during the sixth visit and submitted them again to DGEEU.

### **11.5.2. Developing the Format of Competency Element for Engineering Manger**

The smallest units necessary to evaluate each competency standard are called “competency elements” and all the candidates need to learn them to have qualifications of competency standards. As shown in Figure 9.1.5, a competency standard format consists of a list of elements, usually 3 -12 elements, and performance criteria that describes performance results and output based on competency elements.

JICA Team developed each competency element and its performance criteria as the required competencies for the Engineering Manager after having a discussion with DGEEU. The Team suggested the draft formats of competency standards in each category, for example, construction, Operations and Maintenance and broke down the competency elements into more detailed titles such as Planning, Designing, Construction, restoration of accidents, Operations Management,

Inspection, Patrol and Maintenance Works.

As a result of the aforementioned JICA's assistance, the Indonesian DGEEU will review JICA's proposed format of the technical team established in February and will hold a consensus forum to introduce to stakeholders. The Indonesian DGEEU will add other components such as parameters of unit competencies and evaluation guidance to establish all the contents of the competency standard. Further, it will be legislated as the official competency standard after approving Minister of MEMR by the end of 2010.

### **11.5.3. Establishment of Institutional Framework for Qualifying Engineering Managers**

In establishing a qualification system for Engineering Managers, it is expected that at an early date, the decisions regarding who should take on the qualification business, and how provisions for supporting those bodies to set up new business would be constructed should be made. Although it is realistic to set a transitional period for introducing the Engineering Manager System, at the end of the transitional period, a Qualification System must be smoothly operated in an ordinary manner.

To complete the institutional framework, the Competency Standards for Engineering Managers needs to be prepared at an early stage. Additionally, the framework for the Qualification System, proposed by the JICA Team in Chapter 9, must be customized in line with the circumstances in Indonesia. In proceeding with these works, it is expected that a consensus for an optimal and prompt institutional design would be formed by holding workshops or seminars, and exchanging various opinions involving broad-ranging stakeholders.

### **11.5.4. Roadmap for implementing Qualification System of Engineering Managers**

Regarding the amount of qualification works that needs to be inputted after the end of the transitional period of the Engineering Managers System, how much new resources must be injected needs to be estimated if the existing Certification Bodies are to newly take on the qualification works of Engineering Managers. In estimating this quantity of work, the necessary number of Engineering Managers for all of Indonesia as a whole, the necessary number of newly qualified persons required every year to meet natural reductions and so on must be taken into consideration. In addition, work the amount or density for establishing the new system will

change according to the duration of the transitional period. Unless enough duration is given to the transitional period, the work density for paving the way for the new system will increase. In order to not increase the burdens imposed on Certification Bodies, a sufficient amount of deliberation in setting the duration of the transitional period should be taken with the resources necessary for operations on a normal basis after the end of the transitional period and should not largely differ from the ones necessary for establishing the new system.