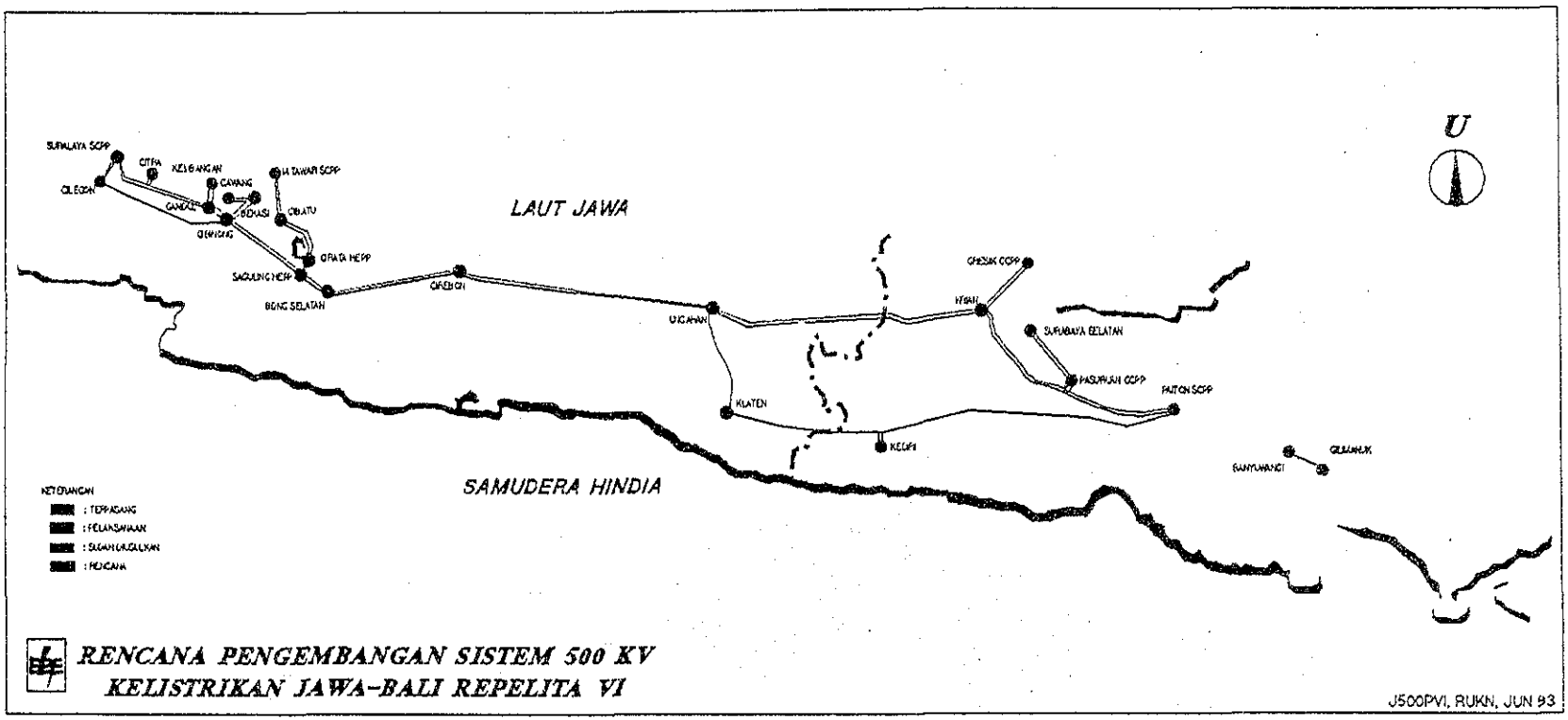
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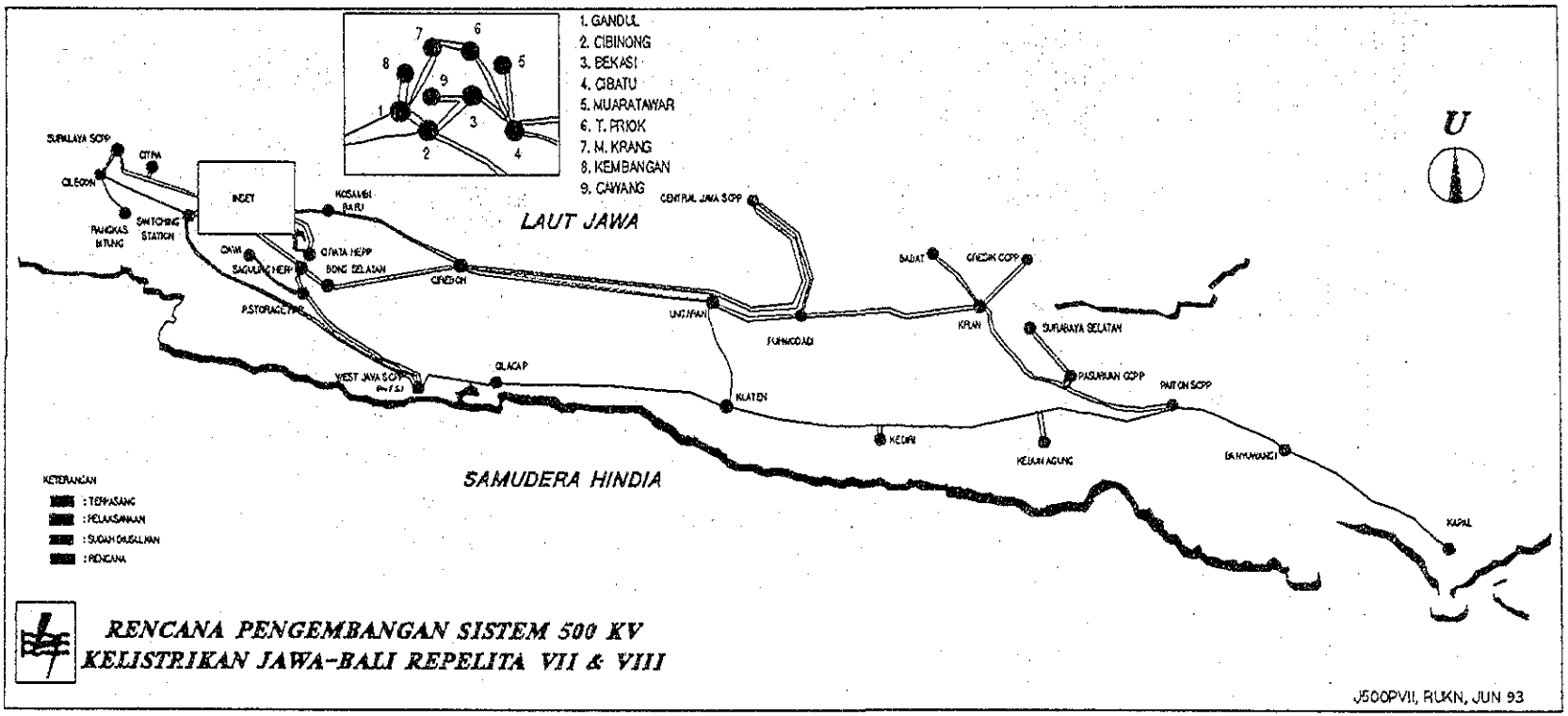
PAITON SCPP
KLATEN
KETERANGAN
: TERPADANG
: PELAKSANAAN
: SEDANG DIUSULKAN
: RENCANA
RENCANA PENGEMBANGAN SISTEM 500 KV
KELISTRIKAN JAWA-BALI REPELITA VI
J500PVI, RUKN, JUN 93


1. GANDUL
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4. CIBATU
5. MUARATAWAR
6. T. PRIOK
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: SUDAH DISALURKAN
: RENCANA
RENCANA PENGEMBANGAN SISTEM 500 KV
KELISTRIKAN JAWA-BALI REPELITA VII & VIII
J500PVII, RUKN, JUN 93

(1) Survey on the Rational Use of Energy

The Application form Japan's Development Survey

Application

Project Title : Survey on the Rational Use of Energy

Government of Republic of Indonesia

Total Project cost : $ 550,000

Responsible Ministry (Ministry requesting it)	Implementing Agency (Agency in charge of execution of the project)
Ministry of Mines and Energy	Directorate General Electricity and Energy Development

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Project Description

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1. Background (Please describe on detail)

(1) Energy Situation in Indonesia

Energy consumption in Indonesia

Energy consumption in almost all economic sectors, mainly industrial, transportation and household sector, shows an escalating trends. It is predicted that final energy consumption in industrial sector alone will which reach the figure of 121.84 million BOE in 1991/1992 and will increase to 128 million BOE in 1992/1993, and by the end of the fifth-five years development plan (1993/1994) will move up to 134.37 million BOE. Meanwhile, the consumption pattern in transportation sector will also show an increasing trend. The final energy consumption in this sector will about 77.26 million in 1991/1992. The figure will continue to grow and reach 80.95 million BOE in 1992/1993 and by the end of the fifth-five years development plan (1993/1994) will reach 84.852 million BOE. In household sector, final energy consumption is estimated to reach 57.99 million BOE in 1991/1992 and slightly increase to 59.20 million BOE in 1992/1993. By the end of the fifth-five years development plan (1993/1994), the final energy consumption will be in the neighborhood of 60.25 million BOE.
Opportunities to conserve energy in Indonesia

Recent studies indicated that a significant amount of saving can be generated in several economic sectors. To address the question on energy conservation potentials in Indonesia, it will be necessary to analyze them according to sectoral bases.

(a) Household sector :

A recent study (in 1987/1988) done by Directorate General for Electricity and New Energy and ESMAP (World Bank) has identified that there is an ample room for conservation remains in household sector, approximately 30 % of the operating energy in household sector can be saved. The future extent of energy savings varies with the efficiency of appliances, types of fuel and other factors such as attitude of the owner.

(b) Transportation sector :

This sector consumed the second big proportion of domestic commercial energy supply after industrial sector. Although measurement of waste and efficiency in energy use have not been precisely taken, there was a strong indication that transportation sector performance in Indonesia could be substantially improved.

(c) Industrial sector :

As the major energy consuming sector (+- 40 percent of the total energy commercial use in the country), industry posses the greatest opportunity of saving in Indonesia. The cheap domestic fuel price has led to a relatively inefficient energy use in intensive industrial plants and created a substantial amount of energy saving potentials. Based on the studies done by Directorate General for Electricity and New Energy and Trans Energ in 1985, approximately 10 to 30 percent savings can be achieved.

National energy conservation targets

National energy conservation programmes with several targets up to the year 2000 have been prepared. Basically, the programs cover the same elements as the previous programmes but with more solid objectives and concrete targets to be achieved. The reduction of domestic energy use up to 17 % which is equivalent to 106 million barrels of oil or 4 billion rupiah annually has been fixed as the target of national energy conservation programs by the year 2000.

Qualitative and quantitative energy conservation targets over certain period of time are carefully set for each energy sector in order to achieve overall national targets in the year 2000. Quantitative targets such as reduction of 20 % industrial energy consumption and 15 % of reduction on energy consumed in each transportation and household sectors have also been set.

(2) Problems to be solved

Based on the results of a study on the potential of saving (1984) are still high or there is still an ample room for energy saving realization in almost all sectoral demand. This data must be up dated.

Energy conservation implementation is needed to reduce the rapid growth of domestic energy demand.

The result of this study will be used to design regulatory measures, energy device standard, the efficient procedure and energy efficiency.

(3) Necessity and importance of improvement in the sector which lead to the formulation of the project.

The prospects and opportunities for conserving energy and using it more efficiently are substantial. Therefore, efforts should be identified and taken to removed the barriers of conservation act.

(4) Relation between the sector and the project

This ample rooms for conservation need further government efforts to make it possible to be realized. The efforts include more intensive survey and auditings to find out not only the potential of savings, but also real problems, barriers faced by the energy consumers in rationalizing their energy consumption.

(5) Reasons why Japan's grant aid is requested for this particular projects.

Study on the rational use of energy, is the important to know about the effort to reduce national energy consumption in Indonesia. Japan is some of the countries which is successful in energy conservation programs. We need the experiences of Japan expert to conduct the energy conservation problem and due to the limited budget of the Government of Indonesia, we have the feeling that Japan's Grant Aid is the best solution.

2. Objectives and outline of the project

(1) Objectives of the project

(i) Short-term of the project

The main objective of the study is to formulate strategy for rationalization of energy utilization in all sectors, in other word to formulate ways of solving the users problems in implementing energy conservation in industries, transportation, household and commercial buildings.

(ii) Medium and Long-term Objectives

To make the government of Indonesia recognize the importance and the benefits of energy conservation efforts and thus to raise the priority of the sector for further economic growth reason.

(iii) Please fully describe the relations between the project and objectives, and how the project will contribute to the accomplishment of the objectives.

Indonesia has a great potential energy savings (about 10 - 30 %). This study will support the national energy conservation target. Energy conservation will have a great impact particularly on the economic development of a country. Indonesia is now intensifying it's energy conservation programme for several immediate problems.

(2) Outline the project (Please give a full description of each facility and equipment and their detailed specifications)

The proposed project covers the following activities :

a. Literature survey on the energy situation in Indonesia;
b. Review on the previous studies related to the energy conservation in all sectors;
c. Pre-audit (Preliminary energy audit) in industries, commercial buildings and transportation sector;
d. Problems and barriers identification on the implementation of energy conservation.

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3. Other assistance

(If there was assistance in the past from JICA or other donor of request closely related to this project, please fill in below)

(i) Name of donors

JICA

(ii) Title and outline of the assistance

Technical Assistance/Development Study

(iv) In the case where other donors do not extend the assistance, please describe in detail appropriateness and effectiveness of this project;

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4. Priority

(Please describe priority of this project among other projects for which requests are made to Japan)

(Please attache project list which priorities)

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5. Preparation

(1) Project Site (Please attach photographs and maps if it's possible)

(i) (a) Address of the Site

Jakarta

(b) Total area of the Site

-

(ii) Land preparation

(a) To which extend has the land been appropriated for the project ?

-

(b) When will the appropriation of the land be completed ?

-

(2) Electricity, Water Supply, Telephone, Drainage and Other Facilities

(Please describe the extend to which above mentioned incidental facilities has been prepared)

(3) Is there any information, statistic and data regarding geographical, geological, meteorological, oceanographical situations, etc.

(If any, please attach those information)

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6. Improvement Plan (if any, please describe in detail the contents of such a plan that will enable the Agency to handle the project more effectively and efficiently)

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7. Operation and Management of the Project

(1) The number of personnel

(In the case where necessary personnel are not yet secured, when and how is to be done)

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(2) Budget (please fill in the budget in the below table)

	2 year ago (19)	1 year ago (19)	Now (19)	When the Project will be completed (19)
Supervising Ministry				
Implementing Agency				
Direct Budget of the Project			$ 550,000	

(In the case where additional budgetary allocation is needed for the implementation of the project, please answer the following question)

(i) Has the additional budget been already allocated ? No

(ii) If no, how and when will the additional budget be allocated?

(3) Technical abilities of local staff

(i) Please describe technical abilities of local staff operating the project.

(ii) Please describe in detail educational background of those who are in charge of the operational and management.

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8. (Please fill in below if there is a project executed by another donor country or international organization in related areas)

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(1) Name of donor

JICA

(2) Project title

Survey on the Rational Use of Energy

(3) Project Outline

(4) Type of Assistance
(grant, loan, technical assistance, etc) : Technical Assistance

(5) Project period

12 months

(6) Relations with this Project

(2) The Development Study of Indonesia National Standards, Quality Control and Certification System

up. Bapak. Eiko
Biro Industri &
Pertambangan.

(Technical Assistance Proposal)

Code Number: DTA 335

1.	Project Title	: THE DEVELOPMENT STUDY OF INDONESIAN NATIONAL STANDARDS, QUALITY CONTROL AND CERTIFICATION SYSTEM.
2.	Location	: Jakarta
3.	Executing Agency	: Centre for Industrial Standardization, The Ministry of Industry.
4.	Objectives	: To enhance the application of Indonesian National Standards including the related quality control practices and certification system towards the registration of ISO 9000 and JIS marking approval.
5.	Project Description	: - Harmonization of national standards to meet the international standards requirements - Development of effective strategy for the implementation of Indonesian National Standards - Development of appropriate quality control methods - Strengthening of capability of product testing and certification system - Strengthening quality management system in the industries. At this stage the industrial subsectors will be considered.
6.	Implementation Time	: 12 months

7. Scope of Assistance : Requested

a. Expert services	60 m.m	= US $	600,000
b. Fellowships	24 m.m	= US $	120,000
c. Equipments		= US $	100,000
	Total cost	= US $	820,000

8. Related to Project Aid : -

back-stu

TERM OF REFERENCE

FOR

DEVELOPMENT STUDY OF INDONESIAN NATIONAL STANDARDS, QUALITY CONTROL AND CERTIFICATION SYSTEM

CENTER FOR INDUSTRIAL STANDARDIZATION

MINISTRY OF INDUSTRY

REPUBLIC OF INDONESIA

I. BACKGROUND AND SUPPORTING INFORMATION

1. Justification of the Project

The target of second phase of Long Term Development Plan has placed emphasis on the development of industrial technology through the leveling-up of industrial standardization, quality control and certification which aims at the objective to transform the economic structure of the country from the agricultural economic base to industrial economic base.

In the globalization era, industry must continuously improve competitiveness both on the local and the international markets. Effective cooperation between the government and industry is essential.

Within the globalization era standardization and quality assurance will play an important role in facilitating trade. The European Community policy on Global Approach to testing and Certification might be regarded as a frontier in setting up schemes to promote mutual trust on quality assurance. For the sake promoting of world trade, mutual recognition of each country's quality scheme, based on transparancy and objective, is needed.

It is justified that the above basic aims will be possible only by product quality and management system improvement. Actually, the improvement on quality of industrial product through the development of standardization, certification system and certification has been recognized as a matter of public concern.

In other words, national standardization and quality assurance capacity is indispensable element to help promote industrialization of the Republic of Indonesia.

2. Project Title

"The Development Study of Indonesian National Standards, Quality Control and Certification System".

The objective of the study is to enhance the application of Indonesian National Standards including the related quality control practices and certification systems towards the registration of ISO 9000 and JIS marking approval.

The study has two interrelated objective on strengthening the overall capacity of the institutes and industries and increasing the output of Centre for Industrial Standardization to improve product quality in 5 priorities industrial subsectors.

At present, there are some institutes responsible for standardization and certification such as Centre for Industrial Standardization (PUSTAN), Directorate of General, Agency of Industrial Research and Development (BPPI). PUSTAN is responsible for coordinating the formulation, implementation and development of Industrial Standard, while Directorate General are responsible for the development of industries. BPPI have authorized 22 laboratories in conducting testing and inspection services.

Also at national level, laboratory accreditation and certification system have been established to support the development and implementation of national standards.

Based on JICA study on Industrial Sub-Sector Development in the Republic of Indonesia which was held in 1989 - 1991 was found that the use of Industrial Standards in private companies have not been effectively implemented, testing facilities to check the product quality are mostly antiquated and the most important things are there is a shortage of instructors and assesors to meet the rapid progress of industries.

Since Japan has sucsesfully developed a very high experience in standardization, quality control and certification i.e. JIS, therefore technical cooperation from Japanese Government will be valuable for ensuring the prospective result for implementing this project.

Standardization, Quality Control and Certification Systems is a very comprehensive and wide programme. To complete the whole objective of the project it will need a long term continuing project of 5-6 years and to start with the programme it will need a master plan to set out priority of activities considered in the programme.

It is expected by the end of the project, Centre for Industrial Standardization (CIS) will have a masterplan and priority of the development of the application of standardization and quality assurance in the industries on a continuing sustainable basis.

3. Institutional Framework

In this term of reference Centre for Industrial Standardization, Ministry of Industry will be the Executing Agency of the project.

It will benefit institutionals in the field of standardization, quality control and certification system and provision of selected industries through quality management systems and product certifications i.e;

- Some selected industries
- Directorate General concerned with the industry
- Testing Institutes concerned.
- National Standardization Council (DSN).

4. Government Follow Up

It is expected that the target beneficiaries of the project, by the end of the project, would have aa reference for priorities of action to develop the application of Indonesian National Standards as well as the implementation of quality management system of ISO 9000 in the industries.

The better resource utilization for effective cost controls, quality assured product, rationalization and adoption of codes of good manufacturing practices, trained man power, skilled engineers and capability to design new product to the state of the art technology are expected as the implementation of the masterplan.

The needed interlinkage, which is also the government and national policy, will become fully organized in the industries through the assistence of their project. This would be the most positive outputs which will assist to expand the export market.

II. OBJECTIVE OF THE PROJECT

The development objective of the project is to promote productivity in manufacturing and assist Indonesian Industry to produce goods of acceptable quality and economically production through application of standardization, quality control practices and quality assurance. The project has interrelated objectives on strengthening the institutional capability and increasing the quality products output of the industries.

II. 1. Immediate objectives

Based on the recognition as already mentioned, the project should be work out with the setting the strategy up of following immediate objectives:

- Harmonization of national standards to the international standards.

- Effective application of Indonesian National Standards

- Utilization of appropriate quality control methods through the application of JIS marking system.

- Accreditation of testing laboratories and inspection agencies as well as certification bodies in conformoty with the international standards requirements.

- Application of quality management system in the industries through the certification of ISO 9000.

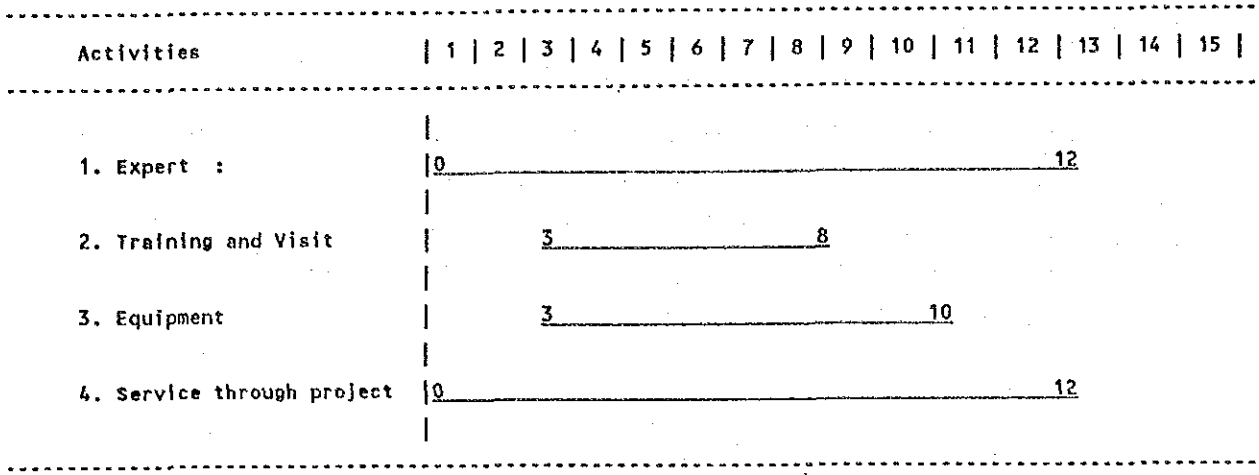
II. 2. Long - run Objectives

The overall project objectives is not only strengthening the institutional capability but also creating an atmosphere of quality products which will assist to expand and sustain the export market, skill transfer as well as technology acquisition.

III. PLAN OF OPERATIONS

To reach the objectives, emphasis should be placed on the following strategies;

- Develop appropriate national standards and harmonize them to internationally accepted standards
- Enlarge the application of national standards in the industries
- Consolidate national certification and accreditation scheme
- Implementation of quality management system in the industries
- Enhance the testing and inspection facilities
- Enhance research and development activities on testing and standardization technology
- Development of human resources in skill and technology transfer



IV. CONTRIBUTIONS TO THE PROJECT

IV.1. EXTERNAL CONTRIBUTION

Input provided by the JICA Contribution

For the 12 months duration of the project, the following inputs will be made to the project:

1 Chief Technical Advisor
1 Expert of Accreditation and Certification System
1 Expert of Standardization and Promotions
1 Expert of Quality Assurance Technics

Administration Support Personnel:
1 Secretary
1 Clerk

Project Travel
Project travel will be provided, also air ticket for experts and training/managerial visit abroad.

Training

Managerial visit and training abroad to European and Asian Countries.

Sub Contract

- Seminars and training will be provided

Equipment (Expandable and non Expandable)

An average of US $ 100,000 for effice equipments and references has been budgeted. These equipment will be installed in Centre for Industrial Standardization (CIS).

IV.2. INDONESIAN GOVERNMENT CONTRIBUTION

Inputs provided by the Government.

The Government will provide the following inputs to the projects:

- 1 National Project Coordinator (part time)
- 1 Secretary
- 5 Counterpart
- 1 Typist

Secretarial services, office facilities and premises, as well as local means of transportation will also be made available.

Office premises is located at the Centre for Industrial Standardization, Ministry of Industry, 20 th Floor, Jl. Gatot Subroto 52-53, Jakarta.

(3) Study on the Development of the Prepared Ceramic Raw Materials for Ceramic Industry

1. Project Title : Study on the development of the prepared ceramic raw materials for ceramic industry.

2. Location : Bandung.

3. Executive Agency : Ceramic Research and Development Institute, Agency for Industrial Research and Development, on cooperation with Directorate General for Multivariuos Industry, Ministry of Industry.

4. Objective : Establishment of prepared ceramic materials plan.

5. Project Discription:

a. Conduct a technical study on the collected samples from the known reservers and develop benefication technology of prepared ceramic materials and promote prepared ceramic raw materials for various design composition.

b. Conduct investment opportunities study for development of prepared ceramic raw material industries.

c. To carry out the above study enhancement and equipment are needed.

6. Scope of Assistance requested:

a. Expert Services	100 mm	US $ 1,000,000
b. Followships	80 mm	US $ 400,000
c. Equipment		US $ 500,000
d. Local trips		US $ 100,000
e. Seminar	2 times	US $ 20,000
	Total	US $ 2,020,000

TERM OF REFERENCE

I. Background.

Since the middle of 1980's ceramic industries have developed very promising and the contribution to export is getting bigger.
Moreover the industries have showed a contribution to the national economy by creating relatively bigger employment opportunities, as it is considered as a labor intensive industry.

All ceramics industries need stable supply of high quality of raw materials at a good price. In the mean while the indigeneous ceramic raw materials still have low quality and unstable. It is the reason why for producing a high quality ceramic product for export, the industries must import high quality of ceramic raw material from abroad.

Derive from the above information the development of processing ceramic raw materials by using indigenous material must be stressed as fact that raw materials accounts for a large precentage of the total cost.
Ceramic Research and Development Institute is in the position to take a key role on developing ceramic industry. The task of the CRDI are researc and development concerning with basic materials, production processes, products and equipment unvolved in the development of heavy ceramics, mortar, fine ceramics (whiteware and pottery), glass, enamel and special ceramics.

II. Discription of the project:

A. Project Title : Study on the development of the prepared ceramic raw materials for ceramic industry.

B. Objective : Establishment of prepared ceramic materials plan.

C. Project Discription:

1. Development of beneficiation of prepared ceramic materials:

   a. Systematical sampling of ceramic raw material at well known ceramic raw materials deposits (Sumatera, Java, Kalimantan).

   b. Characterization of the ceramic raw material samples.

   c. Development of ceramic raw material beneficiation processing technology to produce standard materials (based on quality required).

2. To promote prepared ceramic raw materials for various design compositions:

   - Mixing design for various composition for porcelain, stoneware and earthenware for produsing sanitair, tabelware, novelties and insulator.

3. To cary out the above study enhancement of capability of the Institute for Industrial Research and Development of Ceramics are needed in the following area;

   a. Special testing in raw materials such as:

      - Viscosity measurement (Ford flow cap, Brookfiel, high shear Method).

      - Measurement of Brightness and Abration resistance.

      - Measurement of very fine grain size.

b. Fitting technology of glaze-body in fast firing.

c. Evaluation of the relationship between microstructure and macro properties (materialscience aspect).

4. To conduct investment opportunities study for development of prepared ceramic raw material industries;

- Preleminary feasibility, study of the prepared ceramic raw material plan: location, quality, market, production cost, etc.

- Preleminary plant design of prepared ceramic raw material processing.

III. Implementation Procedures.

In the carrying out of the project, the sponsor (government) will provide technical assistance by:

1. Dispatcing experience experts,
2. Equipment for activities:

a. Toyota land crushers and Trail Motor Cicle.
b. Hand drill machine for sampling of clay and rock.
c. Polarizing Microscope complete with assessories research type and camera.
d. DTA & TGA
e. Sedigraph
f. PCE test furnace
g. Flotation Machine
h. Fine grinding Machine
i. Magnetic separator
j. Viscocity meter
k. Universal testing machine up to 100 ton
l. Luxmeter

m. Laboratory roller hearth kiln
n. Equipment for NDT test
o. Standard materials: kaolin, ball clay, feldspar, kuarsa, china stone (Toseki), pyrophylite.

Directorate General of Multivarious industry will execute general aspect such as promotion of investment in prepared ceramic material plan, promotion to enterpreneur etc.
Ceramic Research and Development Institute will carry out technical aspect, such as sampling testing, research in processing, mix design etc. At least 6 counterpart of ceramist from CRDI and 2 staff from DGMI will make available to assist the experts in the implementation of the project.

IV. Scope of Assistance Requested.

Government sponsor is requested to finance the project, which covers the following activities such as:

a. Expert Services	100 mm	US $ 1,000,000
b. Followships	80 mm	US $ 400,000
c. Equiment		US $ 500,000
d. Local trips		US $ 100,000
e. Seminar	2 times	US $ 20,000
	Total	US $ 2.020,000

V. Expected Implementation time around 24 months or 100 mm.

Dis.\Tor-kera.

(4) feasibility Study on the Development of POKO and BAKARU Stage II Hydro Power Project

1. BACKGROUND AND SUPPORTING INFORMATION

1.1. Justification of the Project

At present, a large part of nations electric power supply depends on thermal and diesel power plants. Due to the limited natural resources of oil preventing environmental deterioration caused by oil burning also, the development of hydro plant in Indonesia is strongly required the Sadang river which is located in South Sulawesi province.

Power demand in South Sulawesi province where the Poko Power Project is located shows extremely high, increasing at the rate of growth about 15 % per year from 1992 to 1995. In order to meet such extremely high increasing power demand in this province, several power development project are under study. Comparing with such project, Poko Power Project can enjoy its superiority in the meaning of cheaper power supply cost in large scale, being supported by advantageous site characteristics. The project is located upstream of existing Bakaru I and will developed by reservoir type. So, the Poko Project will increased capability Bakaru Project. In this conection, PLN will conduct to feasibility study of Poko and Bakaru stage II Hydro power project.

1.2. Project Name and Scope of Works.

Name of Project : THE DEVELOPMENT OF POKO AND BAKARU STAGE II HYDRO POWER PROJECT

Scope of work :

The services shall perform the study comprising among others :

1. Review and analysis of previous studies and evaluation of the present situation of the power system, if available.
2. Field/site survey and investigation
3. System study
4. Economic and financial justification of the project.
5. Prepare technical specification for site investigations.

The services to be performed will included but not necessary be limited to the followings items :

1.2.1. Review and analysis of existing relevant data and report available and information.

1.2.2. Preparation of topographic map.

a. Aerophoto shooting
b. Dam and Power station site scale : 1/1,000 at 1 m contour interval
c. Waterway, quarry sites and other major / appurtenant structures scale : 1/5,000 at 2.5 m contour interval
d. Reservoir area scale : 1/10,000 at 5 m contour interval.

1.2.3. Topographic survey.

a. Levelling survey and setting of bench marks
b. Ground control survey for photogrammetric mapping
c. Detailed topographic survey for the sites of major permanent structures and constructions facilities

1.2.4. Hydrological and meteorological survey

a. Installation of river water level, rainfall gauging stations, pan evaporation and discharge measurement
b. Analysis of hydrological characteristics of the river
c. Measurement of sedimentation

1.2.5. Physical and chemical test of river water

1.2.6. Geological survey

a. Geological exploration of the dam site, and other major \ appurtenant structures such as tunnel routes, penstock line, power stations site and reservoir area.
b. Seismic exploration of the dam site, waterway route, power station and quarry site.
c. Test boring exploration of the dam and powerhouse foundation and site of major structures and quarry site including permeability and grout test.
d. Data collection of historical seismicity.
e. Test pitting for the borrow area.
f. Surface mapping of the Dam Site, quarry site and borrow area for rock and concrete aggregate and core material.
g. Physical test and analysis for the construction material.

1.2.7. Comparative study on the alternative layout or site of major permanent structures according to the topographic and geological survey results and finalization ot them.

1.2.8. Conduct feasibility study for Bakaru Stage II based on with or without developed Poko project.

1.2.9. Investigation and study of the substation and transmission line route.

1.2.10. Investigation and study of the transportation system and acces road for the construction use.

1.2.11. Power market survey and power developmemt planning :
a. Review and anlysis of relevant information on growth of power consumption, forecast of power demand and characteristics of power consumption patterns, etc.
b. Review and analysis of the present and future programmed power system.

1.2.11. Formulation of optimum plan of Poko and Bakaru Stage II project.
a. Assessment of the peak load demand and energy require ment for each region
b. Optimization studies to determine the site of the project
c. To carry out plant factor optimization in order to obtain the optimum installed capacity.

1.2.12. Determined the installation year of the project based on least cost development plan

1.2.13. Investigation and assessment of irrigation and/or flood control benefits obtained from the regulated outflow, if any

1.2.14. Preliminary design of all components of the project

1.2.15. Study on the lay out and capacity of temporary and preparatory facilities

1.2.16. Assessment on construction inputs such as labour, materials and equipment.

1.2.17. Preparation of general plan for construction and operation of the project.

1.2.18. Investigation of the house, road, land and rights to be compensated in the project area, and recommendation for compensation thereof

1.2.19. Environmental impact assessment including land resumption and resettlement.

1.2.20. Preparation of feasibility level estimate of all costs for construction, operation and maintenance of the project.

1.2.21. Assessment of the economic and financial feasibility of the project.
a. This economic study shall evaluate the project considering the least cost development plan.
b. To carry out sensitivity analysis, this study shall test effect of change in capital cost, fuel price, interest rate, etc.
c. To carry out cash flow analysis.

1.2.22. Besides the above mentioned, the engineer will also prepare the following :

a. *The Project Implementation Program (IP)*

The implementation program for the design and construction of the project be presented in bar-chart from and be specified accordingly the various activities. For the design stage and construction stage be separated.

b. *The Project Cost Estimation*

This shall be prepared as follows :

- Be itemize or specified into the various project components: the civil works, electromechanical works, transmission line, substation all the preparatory works and also to include the Engineering Services cost for the design and for the construction supervision.

- Be specified into the foreign currency and local currency portions and the total equivalent in US Dollar.

- To include the physical contingency and price escalation over the whole construction period.
  (The project cost estimate consists of : the base price + the physical constingencies + price escalation).

c. *The Engineering Services (The Term of Reference and Cost)*

For both, the project design (design stage) and for the construction supervision (construction stage).

- Prepare the terms of reference for the Engineering Services.
- Based on the project implementation schedule, expressed in bar-chart and state the home office and field office M/M and the total trips.
- Based in the above manning schedule including trips prepare the engineering services cost in the foreign and Rp./local currency.
  The total cost specified into the remuneration and direct cost.
  All the document regarding a,b and c shall be submitted to PLN, in draft form in 5 (five) copies.
  After discussion and approved by PLN, the documents shall be finallized and to be submitted in 7 (seven) copies each.

2. OBJECTIVES OF THE PROJECT

2.1. Immediately Objectives

a. To provide the project area with electric power which forms a basis for a development of the area.
b. To protect the downstream area from habitual inundation.
c. To improve the social infrastructure in the area.
d. To up-grade the living standard of the people in South Sulawesi Region.

2.2. Long-term Objectives

a. To contribute to the comprehensive regional development of Province.
b. To promote the development of agriculture and industry.
c. To contribute to the non-oil policy of the government.

3. PLAN OF OPERATION

3.1. Activity Step

The Projects Feasibility Study shall cover the following activity :

3.1.1. "Preliminary Investigation" shall be carried out for site reconnaissance, data collection, planning of investigation work and preliminary survey work.

3.1.2. "Detailed field investigation" shall be made on the optimum dam site according to the preliminary investigation.

3.1.3. "Feasibility grade design" shall be made according to the detailed field investigation.

3.1.4. "Inception report" shall be submitted after preliminary investigation.

3.1.5. "Interim report" summarizing the studies done the stage of preliminary investigation and detailed field investigation, shall be submitted after the completion of detailed investigation.

3.1.6. "Draft final report" shall be made according to the Feasibility design.

3.1.7. "Explanation and coordination of draft final report" shall be made in Indonesia or making consensus between both parties.

3.1.8. "Final report" shall be submitted to Government of Indonesia after reviewing the draft final report.

3.1.9. "Training in Consultant's Home Office" shall be carried out for comparing the technics of site investigation, feasibility design etc. to a number of PLN staff for the period of two months.

3.2. Time Schedule of Study

The time schedule shall be made in the form a bar chart containing data on survey,implementation study, field investigation up to submission of final reports. Time schedule shall include : working schedule and manning schedule. The Study shall be completed within 24 months.

3.3. Computer Program

In order to follow the design carried out by the consultant. PLN wishes to receive once of the study starts a more complete description of the computer program as well as users mannual with have been utilized in the study.

3.4. Reporting and Technical Specification

The following report and tender document of site investigation will be prepared in English and submitted to PLN within time periode indicated below.

- Inception Report and Tender Document of site investigation.
  The inception report (15 copies) and tender document of site investigation (10 copies) not letter than 1.5 months after the starting date.

- Monthly Progress Report
  Monthly progress report (10 copies) covering the field and office studies of the Feasibility Study not letter than 2 weeks in the preceeding months.

- Interim Report
  The interim report (20 copies) sumerizing the studies at the stage of Detail Site Investigation especially concerning the proposal of a selected site for the project, within 2 months after the completion of the detail site.

- Draft Final Report
  The draft final report (20 copies) and implementation program (15 copies) within 6 months after the completion of the Detail field investigation. This report shall summarize all work perform, findings and recommendation for the engineering study and provide maps, plans and diagram of the proposed project.

Final Report
The final report (30 copies) and implementation program (15 copies) within 2 months after finish of discussion and amendement of the draft final report.

3.5. Expertise requirement

a. Team Leader : Hydropower engineer with at least 15 years experience in planning and implementing hydropower development and related works.
b. Geologist with experience in investigation for dam, tunnel, power house and other structures of the hydropower station.
c. Civil engineers (field survey and home office in planning, designing and implementing the hydrological station and related works.
d. Hydrologist with experience in hydrological analysis, water forecast, and sediment balance study on rivers.
e. Electric engineers with experience in electric demand forecast and designing and implementing of electromechanical and transmission lines and substation.
f. Economist with experience in evaluating hydropower development projects.
g. Aerial Photogrammetrics engineers with experience in planning and implementing aerial photogrammetry.
h. Surveyors with experience in ground survey and river survey.
i. Operators with experience in implementing seismic prospecting and supervision of boring works.
j. Environmental expert which has experience in environmental analysis and assessment of hydro power plant.

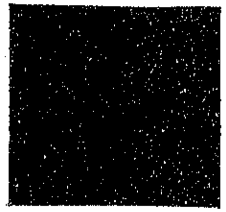
4. GOOD AND SERVICES TO BE PROVIDED BY THE INDONESIAN GOVERMENT

The Government of Indonesia will be undertake the followings :

1. To nominate a counterpart groups consisting of a project coordinator who has responsibility for the survey work and any trouble arising throughout the survey period and other counterpart group personnels.
2. To assist for the feasibility study team necessary entry and exit visas, residence and work permits, and travel permits if required for their study in Indonesia.
3. To arrange in accordance with the GOI's regulation the exemption for the members of feasibility study team from income tax and charges of any kind imposed on or in connection with the living allowances remitted from abroad, and from import and export duties imposed on the member's personnal affears and instruments, equipment and autorizis necessary for the survey will be re- exported after completion of the work.
4. To provide for the feasibility study team permission to enter in project area.
5. To provide for the feasibility study team suitable office for all members with appurtenant furnitures and facilities at the project site during the period of the field survey.
6. To provide available documents such as drawings, maps, statistics, data and information relating to the study.
7. To afford the best assistance for security of life and property of feasibility study team during their stay in Indonesia.
8. To undertake to hear claims, againts the feasibility study team members enganged in the survey resulting from accuring in the course of, or otherwise connected with the discharge of their official functions carrying out the work in the Republic of Indonesia, except those claims arising from the wilful misconducts or gross negligence of the team members.

4. 工業標準、品質管理資料

(1) ＤＳＮ概要



DEWAN STANDARDISASI NASIONAL (DSN)

STANDARDIZATION COUNCIL OF INDONESIA

DSN

Dewan Standardisasi Nasional
Standardization Counsil of Indonesia
Sasana Widya Sarwono - LIPI, Jl. Gatot Subroto 10
Tel. (021) 5206574, 5221687, Fax. 5206574, 5207226
Telex. 62875 PDII IA 62554 IA Jakarta 12710

05/1992

DEWAN STANDARDISASI NASIONAL (DSN)
STANDARDIZATION COUNCIL OF INDONESIA

The Standardization Council of Indonesia – DSN in responding the authority given in it by the Presidential Decree (of 1984 and revised in 1989) and the Government Regulation on SNI (National Standard of Indonesia), functions as the national coordinating body through which organization concerned with standardization and metrology may operate and cooperate to recognize, establish and improve standardization and metrology in Indonesia.

Standardization has contributed to the building of Indonesia's development infrastructure and helped rationalize production in its industries, agricultural sectors, and services sectors. SNI operates through deliberations by some 2,000 experts from industries and academia, as well as consumers. As all SNI are voluntary, except those close-related to safety, health, and environment, it is essential that they reflect the opinions of all concerned.

Like many other countries, the purpose of SNI is to promote :

(i) improved quality and rationalized production;
(ii) smooth and fair trade;
(iii) rational consumption through appropriate and rational "standards"

Some 2,900 SNI are established and some 1,000 are still under process by the end April 1992.

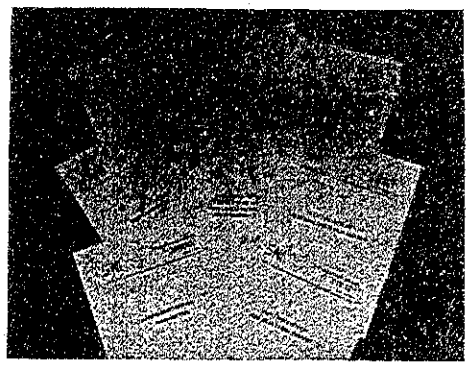
THE NATIONAL STANDARDIZATION SYSTEM

The Natioal Standardization System is made up of organizations and institutions concerned with standardization in Indonesia which are called as technical institutions. Standardization includes such activities as standards-formulating, standards implementation, testing, metrology, certification, and quality assessment schemes.

The System was created to provide a medium through which Indonesian organization and institutions involved in such activities could work together to provide a comprehensive Indonesian standardization capability to achieve quality assurance both nationally and internationally.

Within this System there will be only one standard in Indonesia which is formulated by technical institution and approved by Standardization Council of Indonesia – DSN, and called SNI – Standar Nasional Indonesia.

The procedure for establishing and reissuing SNI is transparant and open to all interested parties. As far as possible, the SNI are harmonized with the existing international standards.



COMPONENTS OF THE SYSTEM

The National Standardization System currently comprises several accredited standards-formulating institutions, implementation, testing and certification institutions, metrology institutions, and the Indonesian organizations concerned with national and international standardization. The system depends on the resources and skills of these institutions and the individuals who participate in their work. The National Standardization System consists of six subsystem :

- Subsystem for standard formulation
- Subsystem for standard implementation
- Subsystem for standardization development and control
- Subsystem for standardization cooperation and information
- Subsystem for metrology
- Subsystem for accrediatation.

The Standardization Council of Indonesia, is a non structural body which coordinates, synchronizes and maintains the standardization and metrology activities in Indonesia which is responsible and report directly to the President.

OBJECTIVES OF DSN

The Standardization Council of Indonesia has the following primary objectives :

* to coordinate, synchronize and maintain the cooperation among the institutions concerned with the standardization and metrology activities.
* to submit advice and recommendation to the President concerning the national policy and standardization and development of national physical standards.

SNI MARKING SYSTEM

The SNI marking system is used to encourage standardization. Under the SNI marking system, following government inspection regarding quality control and quality assurance and other factors, authorized manufacturers are permitted to attach the SNI marks to products which satisfy the SNI standards, thus helping users and consumers to judge the quality and performance of the product. So far, some 322 items bear the SNI mark, and some 1331 permits have been granted.

The SNI mark certification system certifies the conformity of products to SNI standards based on the factory quality control system and on the international quality assurance system (ISO 9000 series).

SNI

ORGANIZATIONAL STRUCTURE

The Standardization Council of Indonesia – DSN is headed by a chairman. The daily work of the Council is carried out by the Executive Council. The Secretary of the Council acts as the Chairman of the Executive Council.

Pusat Standardisasi – LIPI (The Institute for Standardization – Indonesian Institute of Sciences) provides the Secretariat of the Council with the task to carry out administrative and technical services both to the Council and Executive Council.

For supporting the task of the Council, six Committees are formed with specific function to carry out coordination, evaluation and assessment of standardization activities in a given field.

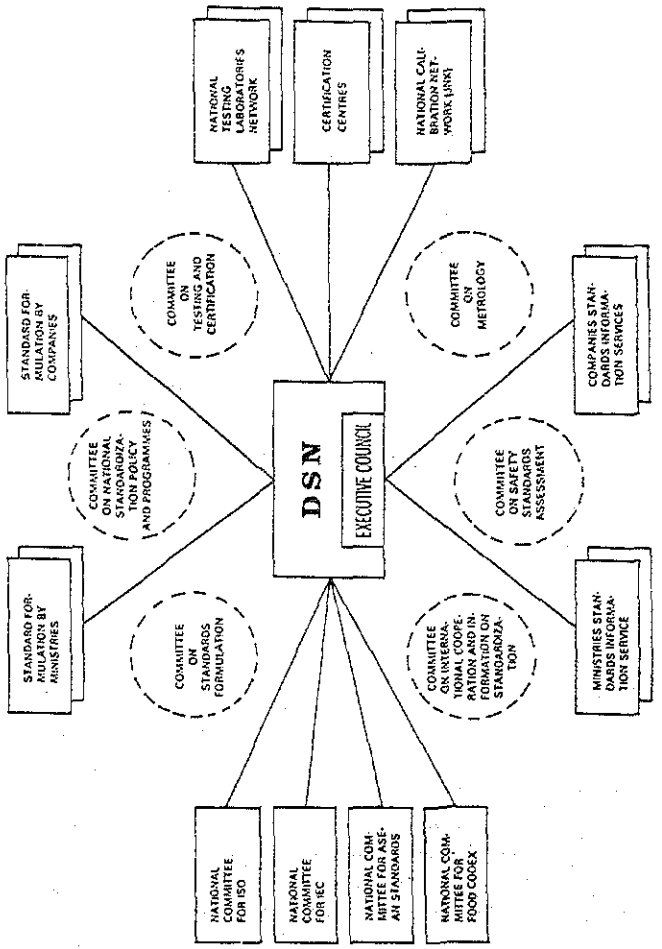
The six Committees are :

1. Committee on Standardization Policy and Programmes
2. Committee on Standards Formulation
3. Committee on Standards Implementation, Testing and Certification.
4. Committee on International Cooperation and Information on Standardization.
5. Committee on Metrology.
6. Committee on Safety Standards Assessment

To support the task of the Council on Metrology, the Council establishes Committee on National Physical Standards whose members consists of experts on specific field of metrology.

To support the task of the Council on Accreditation and Certification, the Council establishes Committee on National Accreditation, which accredits inspection and testing laboratories, and certification bodies for quality system, products, personnel.

NATIONAL STANDARDIZATION SYSTEM IN INDONESIA



ORGANISATIONAL STRUCTURE

THE STANDARDIZATION COUNCIL OF INDONESIA – DSN

Chairman : Minister of State for Research and Technology
Vice Chairman I : Minister of Industry
Vice Chairman II : Minister of Trade
Secretary : Deputy Chairman of LIPI
Members : Representative of :
1. Ministry of Industry
2. Ministry of Trade
3. Ministry of Health
4. Ministry of Agriculture
5. Ministry of Forestry
6. Ministry of Manpower
7. Ministry of Public Work
8. Ministry of Mining and Energy
9. Ministry of Communication
10. Agency for the Application and Assessment of Technology
11. National Atomic Energy Agency

EXECUTIVE COUNCIL

Chairman : Secretary of DSN
Vice Chairman I : Member of DSN from Ministry of Industry
Vice Chairman II : Member of DSN from Ministry of Trade
Members : Member of DSN from Ministry of Health
Member of DSN from Ministry of Agriculture
Member of DSN from Ministry of Manpower
Member of DSN from Agency for Application and Assessment of Technology

SECRETARIAT

INSTITUTE FOR STANDARDIZATION LIPI

DEPUTY CHAIRMAN OF LIPI

SUPPORTING UNITS OF DSN

THE STANDARDIZATION COUNCIL OF INDONESIA – DSN

EXECUTIVE COUNCIL

Committee on Standardization Policy and Programme
Committee on Standards Formulation
Committee on Standards Implementation, Testing and Certification
SECRETARIAT
Committee on International Cooperation & Information on Standardization
Committee on Metrology
Committee on Safety Standards Assessment
Committee on National Physical Standards

operational elements

coordinational elements

INTERNATIONAL STANDARDIZATION

International participation in international standards work is an integral part of the National Standardization System. The Standardization Council of Indonesia – DSN represents Indonesia as the Indonesian members body of the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and also represents Indonesia in Codex Alimentarius Commission (CAC). It also maintains liaison with and participates in the work of other international standardization organization.

Pusat Standardisasi LIPI as the Secretariat of the DSN, has been appointed to manage Indonesian participation in the activities of ISO and IEC. The actual work associated with the various technical committees is carried out by expert from various government and private institutions, industries and professional associations.

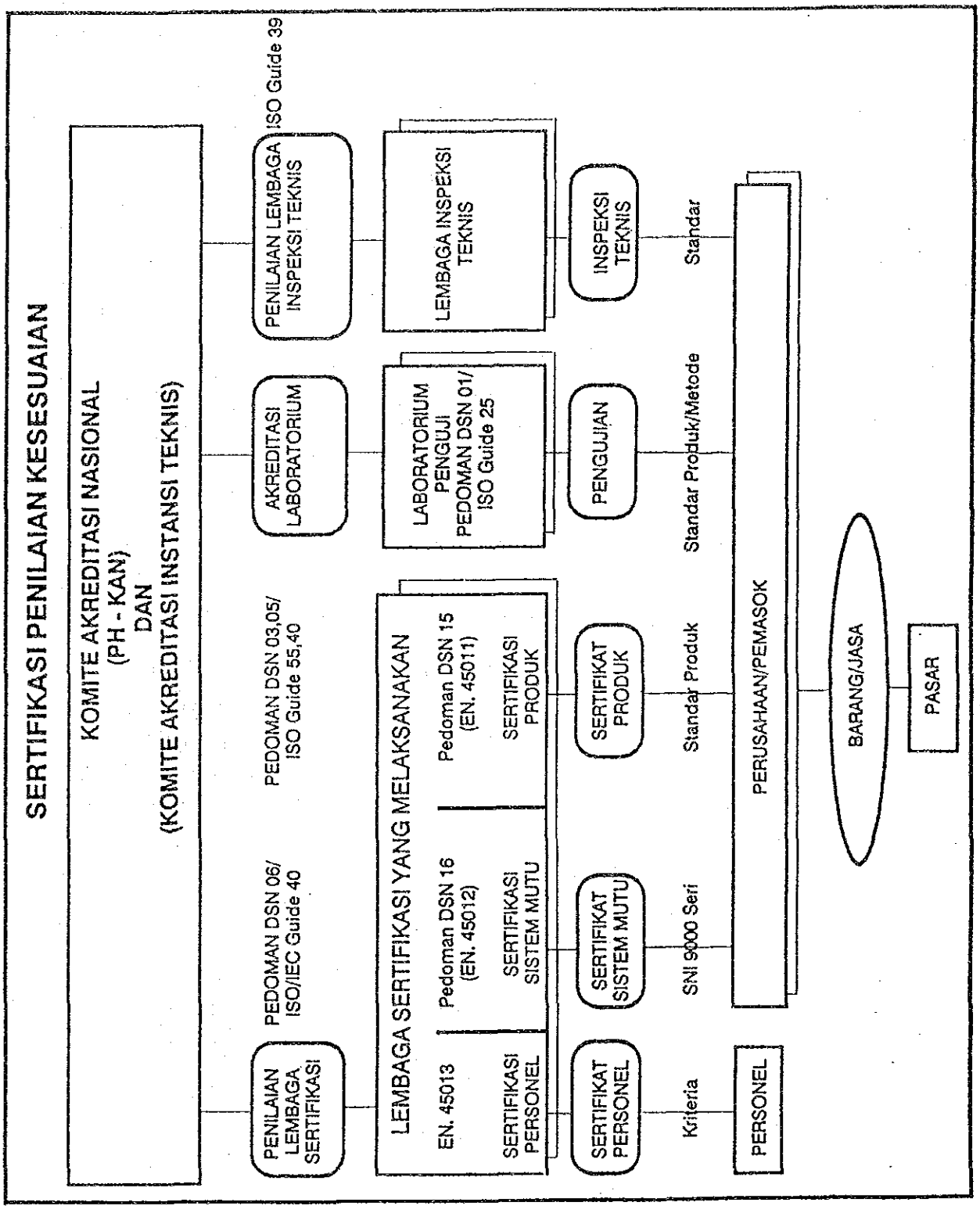
STANDARDS INFORMATION SERVICE

One of the function of the national standardization system is acting as a clearing house of information on standardization. Standards information service, therefore, become vital component of the system. In the National Standardization System, Pusat Standardisasi LIPI as the Secretariat of DSN serves as the central repository and enquiry point for standards and standards related information in Indonesia, supplemented by technical information centres as the standards-formulating institutions.

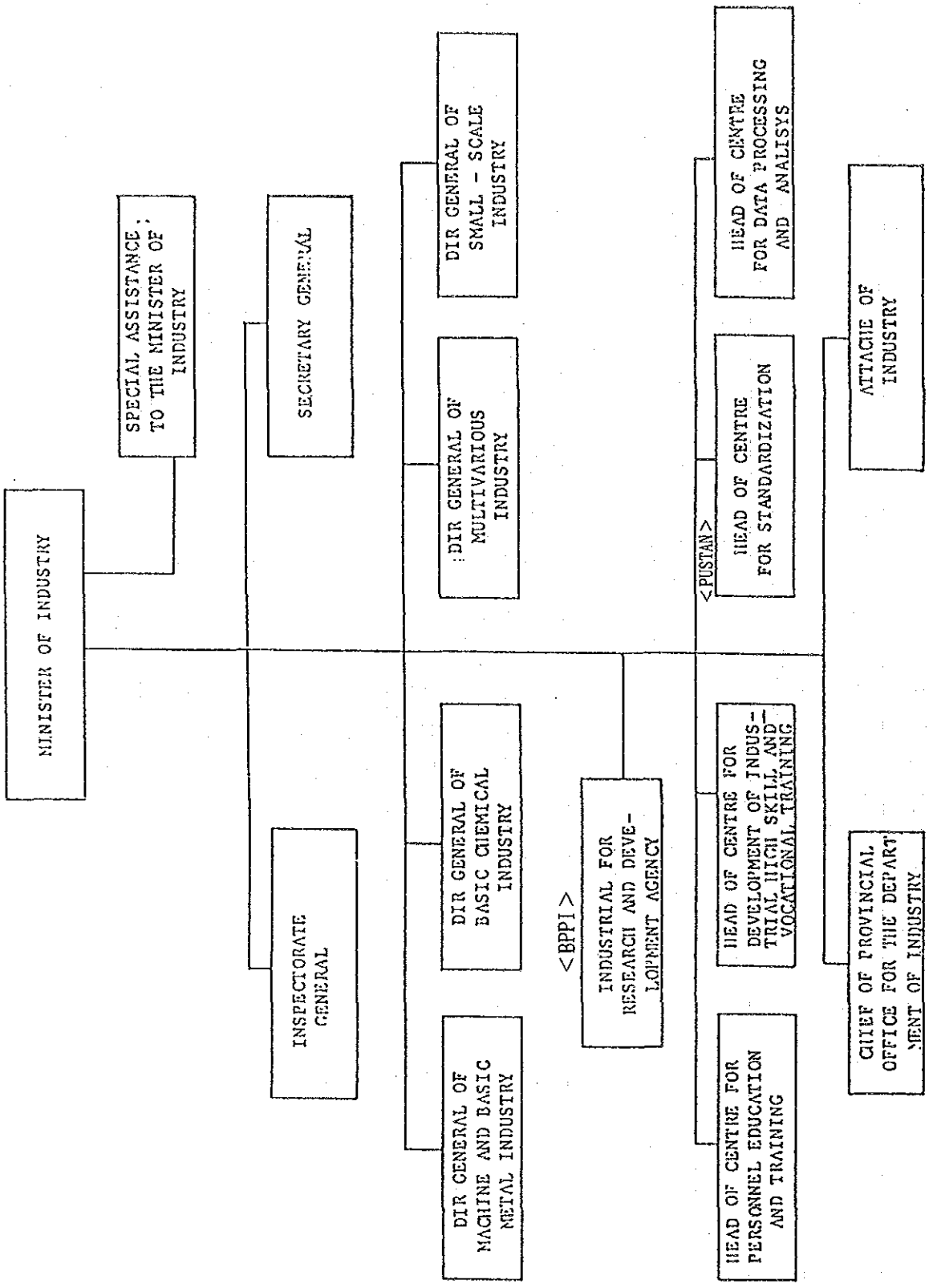
The Standards Information Service provides an efficient information service on national, regional and international standardization and all matters related to standardization activities. The Standards Information Service assits the user in identifying the existence of standards, technical regulations, certification system, and other related standardization activities.

In the National Standardization System, the Standards Information Service of Pusat Standardisasi LIPI together with the information centre of the accredited standards formulating institutions constitute a network of standards information.

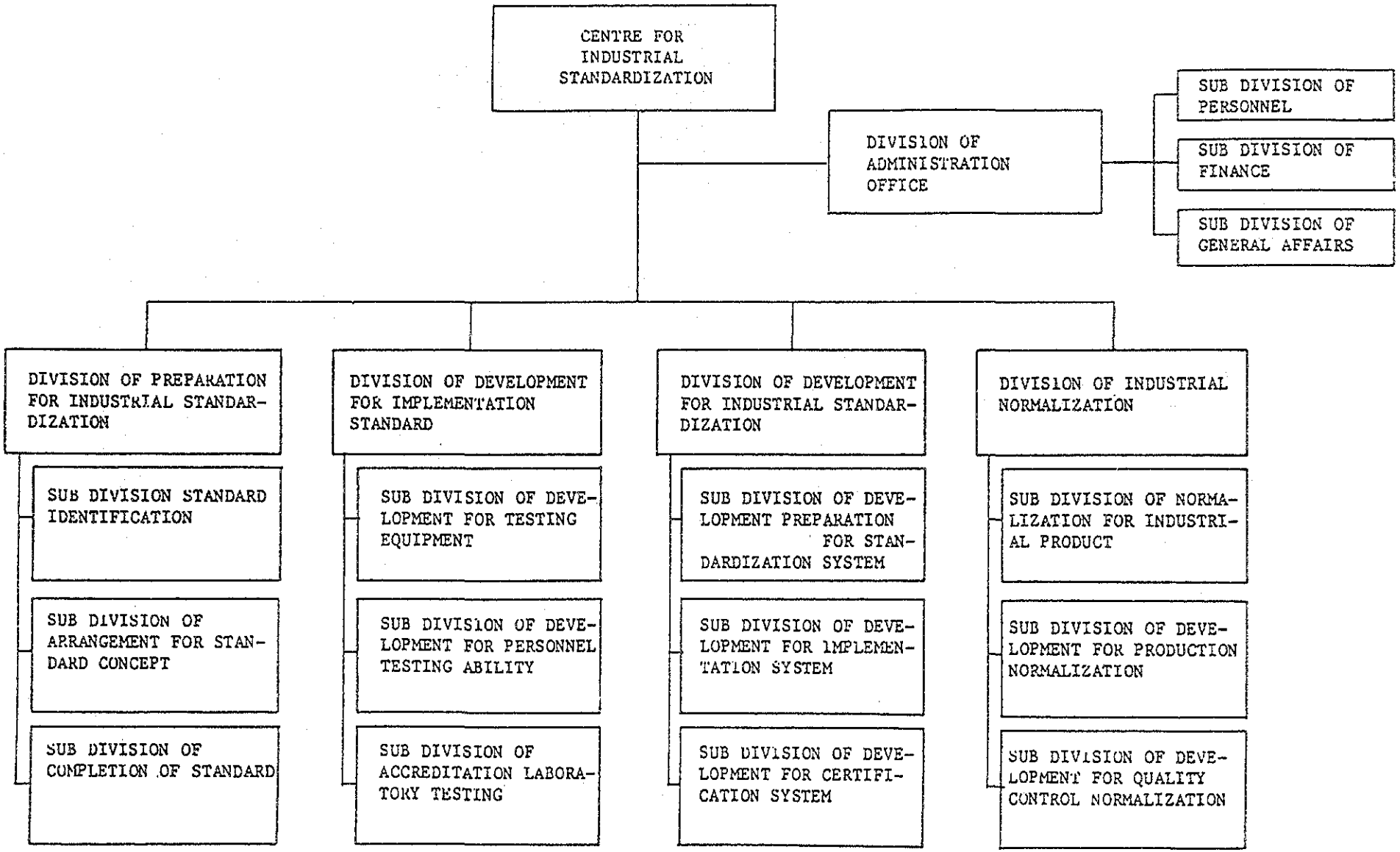
(2) 認定システム


SERTIFIKASI PENILAIAN KESUAIAN
KOMITE AKREDITASI NASIONAL
(PH - KAN)
DAN
(KOMITE AKREDITASI INSTANSI TEKNIS)
PENILAIAN LEMBAGA SERTIFIKASI
PEDOMAN DSN 06/ ISO/IEC Guide 40
LEMBAGA SERTIFIKASI YANG MELAKSANAKAN
EN. 45013
SERTIFIKASI PERSONEL
Pedoman DSN 16 (EN. 45012)
SERTIFIKASI SISTEM MUTU
Pedoman DSN 15 (EN. 45011)
SERTIFIKASI PRODUK
SERTIFIKAT PERSONEL
SERTIFIKAT SISTEM MUTU
SERTIFIKAT PRODUK
Kriteria
SNI 9000 Seri
Standar Produk
PERSONEL
PERUSAHAAN/PEMASOK
BARANG/JASA
PASAR
PEDOMAN DSN 03,05/ ISO Guide 55,40
AKREDITASI LABORATORIUM
LABORATORIUM PENGUJI PEDOMAN DSN 01/ ISO Guide 25
PENGUJIAN
Standar Produk/Metode
PENILAIAN LEMBAGA INSPEKSI TEKNIS
ISO Guide 39
LEMBAGA INSPEKSI TEKNIS
INSPEKSI TEKNIS
Standar

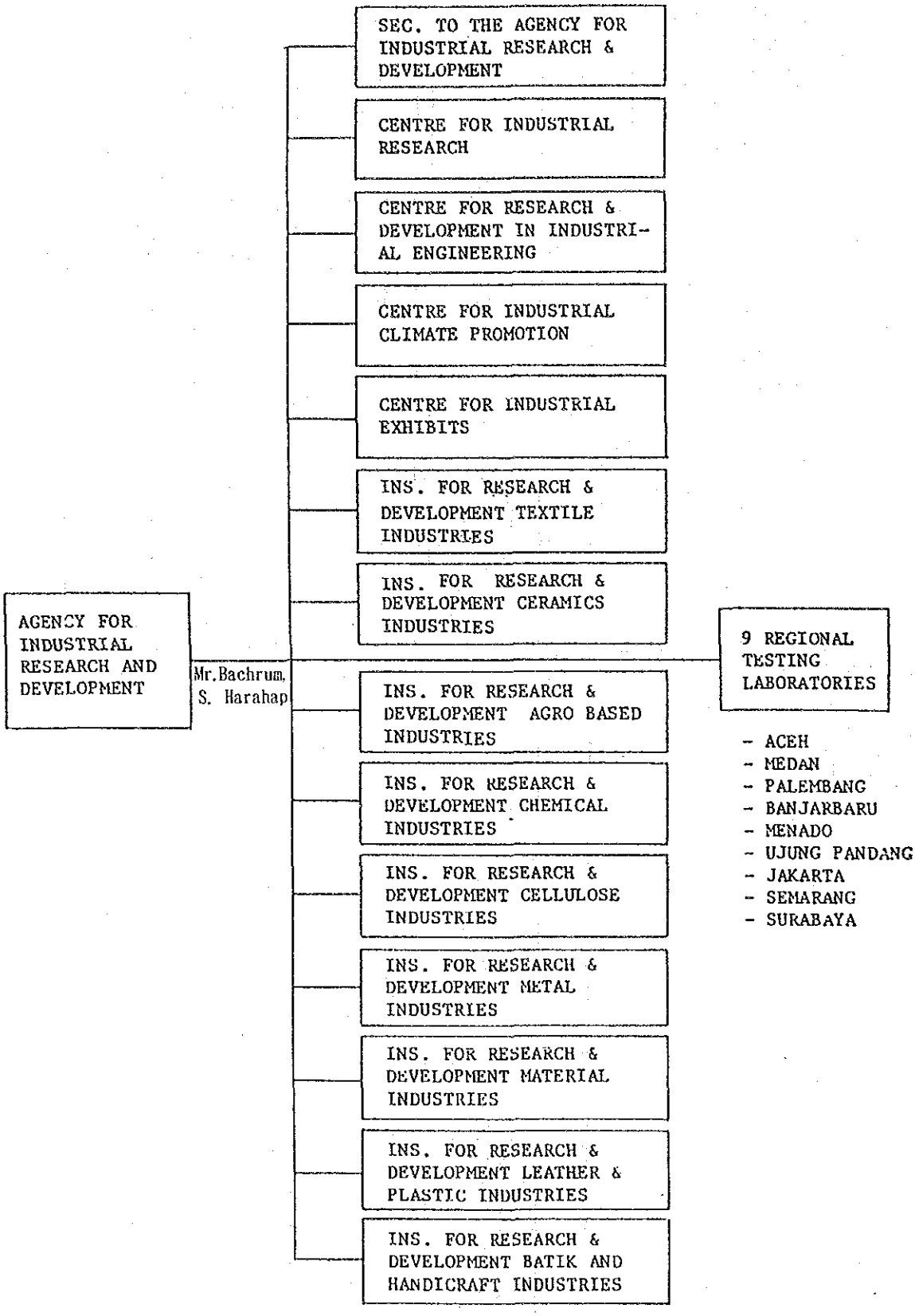
(3) 工業省（MOI）


MINISTER OF INDUSTRY
SPECIAL ASSISTANCE TO THE MINISTER OF INDUSTRY
SECRETARY GENERAL
INSPECTORATE GENERAL
DIR GENERAL OF SMALL - SCALE INDUSTRY
DIR GENERAL OF MULTIVARIOUS INDUSTRY
DIR GENERAL OF BASIC CHEMICAL INDUSTRY
DIR GENERAL OF MACHINE AND BASIC METAL INDUSTRY
<BPPI>
INDUSTRIAL FOR RESEARCH AND DEVELOPMENT AGENCY
<PUSTAN>
HEAD OF CENTRE FOR STANDARDIZATION
HEAD OF CENTRE FOR DATA PROCESSING AND ANALISYS
HEAD OF CENTRE FOR DEVELOPMENT OF INDUSTRIAL HIGH SKILL AND VOCATIONAL TRAINING
HEAD OF CENTRE FOR PERSONNEL EDUCATION AND TRAINING
ATTACHE OF INDUSTRY
CHIEF OF PROVINCIAL OFFICE FOR THE DEPARTMENT OF INDUSTRY

(4) PUSTAN

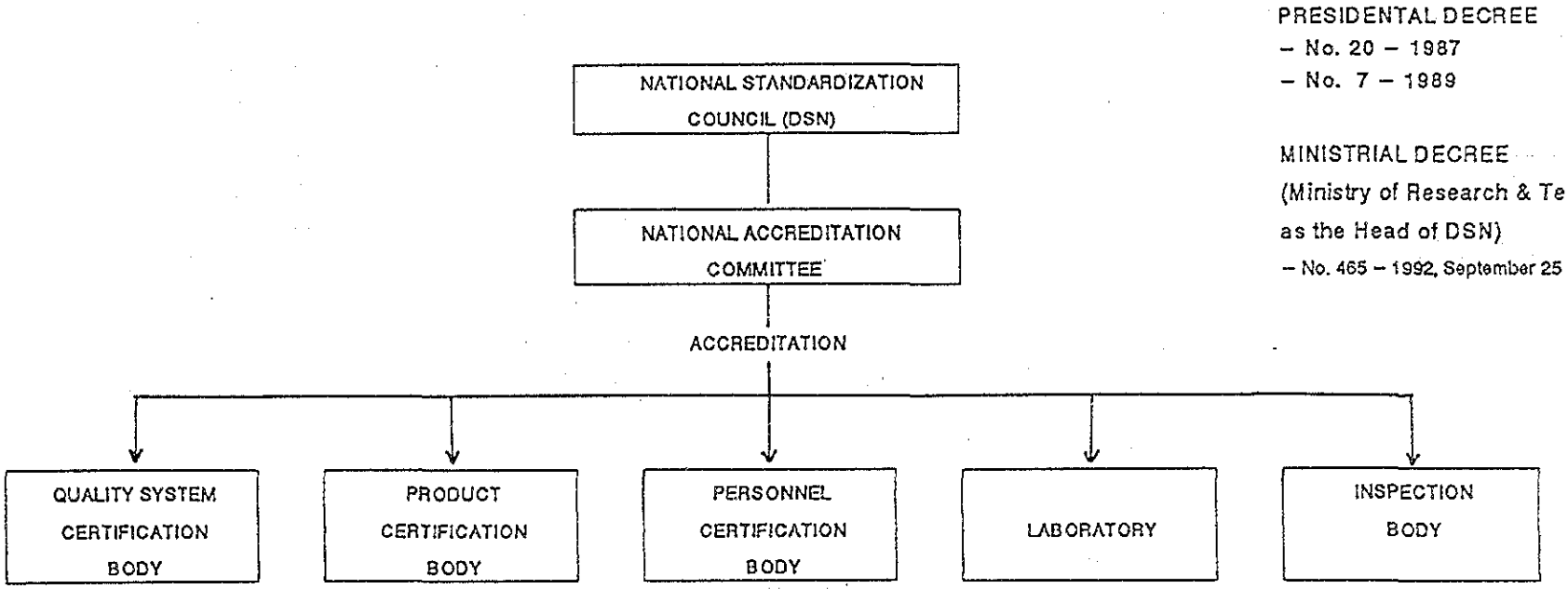

CENTRE FOR INDUSTRIAL STANDARDIZATION
DIVISION OF ADMINISTRATION OFFICE
SUB DIVISION OF PERSONNEL
SUB DIVISION OF FINANCE
SUB DIVISION OF GENERAL AFFAIRS
DIVISION OF PREPARATION FOR INDUSTRIAL STANDARDIZATION
SUB DIVISION STANDARD IDENTIFICATION
SUB DIVISION OF ARRANGEMENT FOR STANDARD CONCEPT
SUB DIVISION OF COMPLETION OF STANDARD
DIVISION OF DEVELOPMENT FOR IMPLEMENTATION STANDARD
SUB DIVISION OF DEVELOPMENT FOR TESTING EQUIPMENT
SUB DIVISION OF DEVELOPMENT FOR PERSONNEL TESTING ABILITY
SUB DIVISION OF ACCREDITATION LABORATORY TESTING
DIVISION OF DEVELOPMENT FOR INDUSTRIAL STANDARDIZATION
SUB DIVISION OF DEVELOPMENT PREPARATION FOR STANDARDIZATION SYSTEM
SUB DIVISION OF DEVELOPMENT FOR IMPLEMENTATION SYSTEM
SUB DIVISION OF DEVELOPMENT FOR CERTIFICATION SYSTEM
DIVISION OF INDUSTRIAL NORMALIZATION
SUB DIVISION OF NORMALIZATION FOR INDUSTRIAL PRODUCT
SUB DIVISION OF DEVELOPMENT FOR PRODUCTION NORMALIZATION
SUB DIVISION OF DEVELOPMENT FOR QUALITY CONTROL NORMALIZATION

(5) ＢＰＰＩ傘下の研究所



(6) 国家認定システム概要

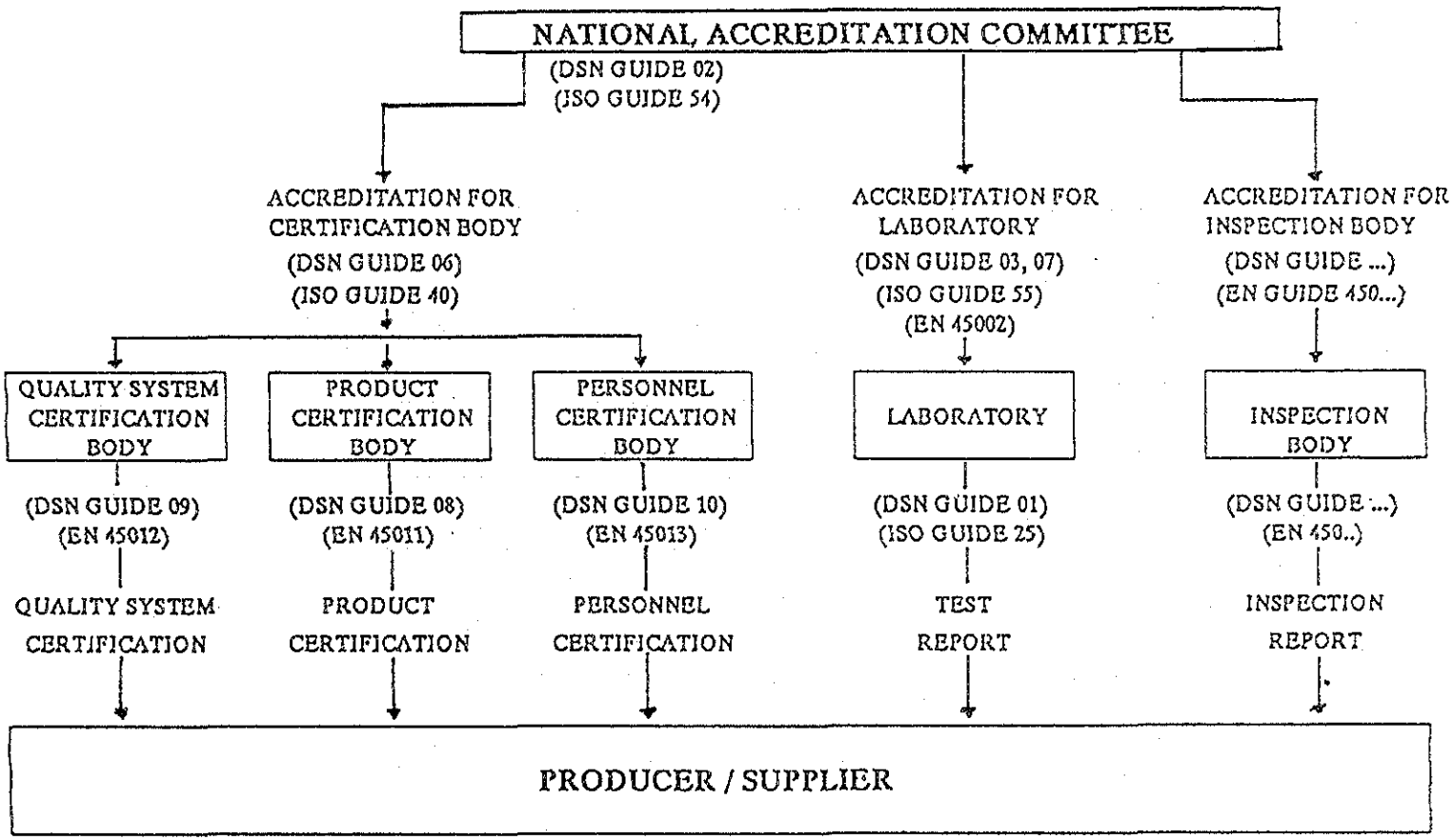
ACCREDITATION SCHEME



PRESIDENTAL DECREE
– No. 20 – 1987
– No. 7 – 1989

MINISTRIAL DECREE
(Ministry of Research & Technology as the Head of DSN)
– No. 465 – 1992, September 25

ACCREDITATION AND CERTIFICATION SCHEME



(7) UNDP調査

SUMMARY

1 Objective

Overall immediate objective to assist the small and medium scale industry to achieve quality and economical production through increasing and accelerating the pace of implementation of Indonesian Industrial Standards and applying the standardization and quality assurance techniques in the automotive field is achieved through:

- Enhancement of capability of the core and Government/ industry concerned on standardization/rationalization through the training programme and also activities such as review of standards and elaboration of guides for rationalization.

- Study and attempt of various means for improving SII standards making and certification system including attempt of adoption of more SII standards by industry and training of the core on certification.

- Strengthening automotive component testing capability in B4T through the setting up of automotive component testing section, on-job training of the staff and training of the core on testing and laboratory administration.

- Upgrade of capabilities of the core and Government/ industry concerned for quality assurance and standardization through the seminar/workshop and on-job training of the core and people concerned, direct technical assistance on quality assurance and standardization to selected small or medium scale industrial units, elaboration of codes of good manufacturing practice and case study report.

2 Lessons

- It is identified that the design and strategy of the project is effective and applicable to another field which requires especial enhancement and development.

- Also it is identified that the local talent, facilities and technology unevenly exists, especially in large scale industry, but many small and medium scale industry suffers from the lack or shortage of these resources.

- Establishment of interlinkage between small and medium scale industry and large scale industry through the

programme conducted in the project could make the small and medium scale industry access these resources easily, as well as the direct technical assistance on quality assurance and standardization, to achieve quality and economical production.

- It is realized as important that the provision of the basic skills on production and knowledge on management is necessary, simultaneously with the assistance on standardization and quality assurance to small and medium scale industry.

3 Recommendation

- For following-up of the activities in the automotive sector specially, as initiated by the project activities of providing assistance, guidance, training and on-job training on the use of standards and quality assurance - it is considered very important and necessary that the Goverment through the Centre for Industrial Standardization prepares a system, to continue giving assistance to the small and medium scale industries, located in various industrial centres. This assistance be provided specially to those centres like Tegal, Ceper, Sidarjo, Bandung and other localities, where the cluster of small and medium scale industries exist.

- For implementing the recommendations proposed, the Centre for Industrial Standardization should, by improving its system for standards implementation and providing the assistance to the industries, build their capabilities to meet the quality requirements, so as to become a partner, through interlinkage with larger industries in achieving better and quicker lacalization and industrialization.

- The assistance to the small and medium scale industries in the field of standardization and quality assurance, should then be also directed to help these industries to become export worthy, and this should be provided simultaneously with the provision of basic skills on production and fundamental knowledge on management.

- For assisting the industries in the field of testing more efficiently, especially small and medium scale industries located in local area, domestic laboratory network should be organized and B4T may be positioned as the apex of the hierarchical network structure, in order to achieve more creable testing, utilize facilities, exchange the data and information, calibrate equipments, accredit laboratories and train

manpower for research and development activity. For achieving this, a certain special arrangement by the Government is expected in conjunction with international cooperation agencies.

- For effective application of the project activities, it is recommended that wherever possible, local talent be utilized by interlinking the various disciplines for which national experts be asked to assist in the programme.

- To the sponsering agency UNIDO, it is recommended to consider formulation of a programme, on similar lines, but on a wider network, to be effective at more industrial cluster areas of small and medium scale industries, so that the important task of building capabilities in these industries, which has just begun, and the interlinkage with OEMs for localization is realized effectively and timely. The use of local talent in the form of national experts, in various disciplines could be effectively utilized under such a programme.

(8) 世銀プロジェクト

MINISTRY OF INDUSTRY
SECRETARIATE GENERAL
CENTER FOR INDUSTRIAL STANDARDIZATION
Jalan Gatot Subroto Kav. 52-53 21st Floor Phone : 512690 (direct) 515509 Ext. 4075
P.O. Box 3538 Fax. 021 - 512690
JAKARTA

INDUSTRIAL RESTRUCTURING PROJECT-I
(IRP-I)
Standards Development Programme
on Engineering

I. STANDARDS FORMULATION

Preparation of ± 600 engineering standards in the field of:

- Basic Standards
- Fastener, Screw & Threads
- Automotive Component
- Storage Tanks
- Metal Forming
- Heat Exchanger
- Safety Products
- Belts
- Milling Cutters
- Food Processing Equipments
- Forging Products
- Agricultural Equipments
- Wood Working Machinery
- Refrigeration Machinery
- Fluid Power System
- Non Destructive Testing
- Pressure Vessel
- Material Handling
- Textile Machinery
- Test Method of Metallic Material, etc

II. LABORATORY ACCREDITATION

Implementation of laboratory accreditation scheme on engineering products testing laboratories.
Technical assistance on accreditation system and strengthening the laboratory to meet the international requirements.

III. STANDARDS PROMOTION

Promotion of the implementation of engineering standards in the industry through information disseminations, seminars, workshops, to develop the quality awareness.

(9) ＥＣ協力

ISQAP

ASEAN-EC INDUSTRIAL STANDARDS AND QUALITY ASSURANCE PROGRAMME

THE MAIN AIM OF THE ASEAN-EC INDUSTRIAL STANDARDS AND QUALITY ASSURANCE PROGRAMME (ISQAP) IS TO HELP MANUFACTURERS IN THE ASEAN COUNTRIES BECOME MORE COMPETITIVE BOTH AT HOME AND ON EXPORT MARKETS BY PRODUCING TO INTERNATIONALLY ACCEPTED STANDARDS. THE PROJECT IS FUNDED BY THE EUROPEAN COMMUNITY WITH A GRANT OF 5 MILLION ECU AND BY THE PARTICIPATING ASEAN COUNTRIES WITH IN-KIND CONTRIBUTIONS.

IMPLEMENTATION

The project is implemented by the Thai Industrial Standards Institute (TISI) through the Central Coordination Office (CCO), under the direction of a Project Steering Committee (PSC) which comprises senior officials of the lead agencies in the participating countries.

The Project Director, Ms. Kanya Sinsakul, Deputy Secretary General of TISI, is responsible to the PSC for the implementation of the project.

The designated lead agencies in the participating countries are :

Brunei Darussalam	—	Construction Planning and Research Unit (CPU), Ministry of Development
Indonesia	—	Centre for Industrial Standardisation (PUSTAN), Ministry of Industry
Malaysia	—	Standards and Industrial Research Institute of Malaysia (SIRIM), Ministry of Science, Technology and the Environment
Philippines	—	Bureau of Product Standards (BPS), Department of Trade and Industry
Singapore	—	Singapore Institute of Standards and Industrial Research (SISIR), Ministry of Technology and Industry
Thailand	—	Thai Industrial Standards Institute (TISI), Ministry of Industry

The project timescale for fullscale implementation is 1 January 1991 to 31 December 1992 with final completion scheduled for 30 June 1993.

PROJECT COMPONENTS

The project has three components :

Harmonization Component

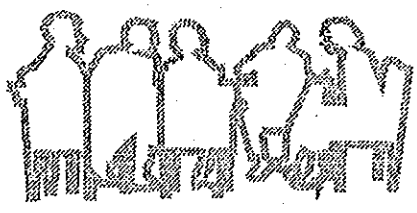
The objective is to promote coherence between the policies of ASEAN countries in the field of standardization, quality assurance, testing, certification and related activities in order to encourage trade within ASEAN, and between ASEAN and the EC.

Strengthening Component

The broad objectives are to increase the competitiveness of industry through the strengthening in the application of internationally recognized standards, quality assurance, testing and certification and to support an upgrading of the capabilities of key national institutes in ASEAN active in these fields.

Coordination Component

The main function is to provide the technical and financial support to TISI, as lead agency, in the overall coordination and management of project implementation.



WORK PROGRAMME

Harmonization Component

There are four programmes under the harmonization component relating to standards, quality assurance, testing and certification.

- Development of a common policy within ASEAN in its relations with the EC;
- The harmonization through the adoption of international/European criteria leading to mutual recognition within ASEAN, and between ASEAN and EC bodies;
- The harmonization of legal requirements for health, safety and the environment in selected sectors through the adoption of international standards;
- The establishment of a mechanism to ensure the free exchange of information within ASEAN, and between ASEAN and EC.

Strengthening Component

There are six major activities in the strengthening component which are more or less common to each country.

- Assisting in the establishment of an internationally recognized quality assurance systems certification body;
- Assisting in the establishment of a national laboratory accreditation system;
- Helping to promote standards and quality, through the enhancement of the standards information function;
- Helping to increase the effectiveness of the technical help to exports function;
- Speeding up the preparation of standards;
- Accelerating standardisation work by adoption, wherever possible, of international standards as national standards.

Coordination Component

In addition to providing the central co-ordinating function within TISI there are certain other activities under the coordination component which concern information systems and project reviews.

It is under this component that technical assistance is being provided aimed at establishing a regional standards information network.

ACHIEVEMENTS

The programme got into its stride in the middle of 1991 and its achievements so far include :

ASEAN FREE TRADE AREA

Under the aegis of the project the move towards the setting up of a new mechanism for cooperation between ASEAN NSBs in the implementation of the ASEAN Free Trade Area.

MUTUAL RECOGNITION

A programme of regional activities aimed at achieving mutual recognition between countries through the adoption within ASEAN of international standards relating to the certification of quality systems and the accreditation of laboratories.

HARMONIZATION

A programme of regional activities relating to the harmonization of standards for safety and environmental protection in the sectors of agricultural machinery; electrical and electronic products; and iron and steel products.

QUALITY SYSTEM CERTIFICATION

The establishment of internationally recognized quality system certification bodies in Brunei. Darussalam, Indonesia, Malaysia, Philippines and Thailand.

LABORATORY ACCREDITATION

The move towards the setting up of a laboratory accreditation system in Indonesia.

STANDARDS INFORMATION

Assistance to Malaysia, Philippines and Thailand in the setting up of computer based standards information centres.

PRODUCT TESTING

Assistance to the Philippines in improving facilities for testing electrical products.

GENERAL

The mounting of seminars in Indonesia, Malaysia, and Singapore on standardization and its relevance to the European Single Market in 1992.

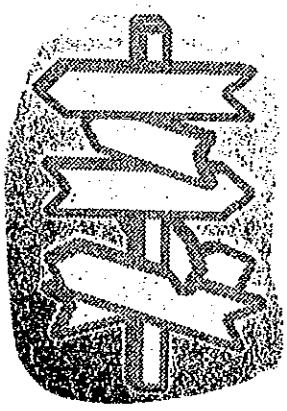
Assistance to Malaysia, Philippines and Thailand in improving their standards production capability.

The dissemination to participating countries by the CCO of all standards emanating from the European standards bodies.

THE FUTURE

To date the project has concentrated on strengthening the institutional capability of the participating countries in order to achieve an internationally recognized framework of standards, quality assurance certification and laboratory accreditation in support of industry. The priority will now move to making industry more aware of the benefits to be gained by using that framework in order to increase competitiveness and to develop its regional and global trade.

The decision of the heads of ASEAN states in January 1992 to establish an ASEAN Free Trade Area will have implications for the project. The removal of barriers to trade can only be brought about through the harmonization of regulations and standards and the development of confidence of the member countries in each others testing and certification procedures. These are major objectives of the project.



Central Coordination Office,
ASEAN-EC Industrial Standards and Quality Assurance Programme,
Thai Industrial Standards Institute,
Rama 6 Street, Bangkok 10400,
Thailand
Tel : 662 246-4250, 246-4252
Fax : 662 246-4327

June 1992

5. 主要工業製品（資本財）の開発計画

(1) EXPLANATORY NOTES

The followings are explanations concerning the proposed development study project titled: "Study for Development of Capital Goods Industry"

I. Definition

1. Engineering products

Engineering products are those mainly made from, but not limited to, metals which are still in the form, of intermediary products or components needed as inputs to produce capital goods. included in these products are basic machine elements (e.g. fasteners, bearings, seals), industrial components (hydraulic and pneumatic components, electrical components, electronics components, etc.), and tooling (such as dies, moulds, jigs, and fixtures).

2. Capital goods

Capital goods are finished products ready used by the end-users to produce other goods. These products can be grouped as ICSC 382 (non-electrical machinery and equipment), ICSC 384 (transport equipment), and ICSC 385 (professional, scientific, control and measurement devices).

II. The study project is not intended to study the capital goods industries at micro (company) level, but rather to study various aspects which affect the development of the industries, such as policy and infrastructural supports, technical and technological capability, manpower skill, market opportunity. It is expected the study project will produce a set of policy recommendations from which the Government will set up necessary development policy and appropriate action programmes.

Realising the wide rage of capital goods industries it is expected, at this stage, the recommendations will focus on capital goods for plant equipment industries which cover textile machineries; rubber, sugar, palm oil processing machineries; etc.

III. Responding to question raised by the JICA's Team Leader (mr. K. Tanigawa) about the progress of the previous feasibility study on the Development of Plant Processing Equipment Industry, the following are some explanations:

1. The objective of the study was to make a renovation plan for BABIBO company, a state owned company comprised of PT Barata, PT BBI and PT Boma Stork.

2. PT Barata launched, in 1986, a rehabilitation programme which included procurement of new machineries and equipment to replace the obselete ones and established CAD/CAM capabilities.

3. During 1989-1990 PT Barata obtained UNDP/UNIDO assistance for plant operation improvement.

DG Machinery, Basic Metals and Electronics Industry
Ministry of Industry

(2) 世銀レポート

1. EXECUTIVE SUMMARY

During November 1980, a World Bank mission visited Indonesia to assess its engineering industry. The engineering industry is by definition technology intensive, built on skills and know-how; therefore, technology, more than any other factor, determines how this industry grows and develops. As a result of the World Bank mission and the support of the Government of Indonesia through the Ministry of Industry, a major study was conducted—from December 1983 through May 1985 and updated in 1987—to help improve the growth and development of the engineering industry. In July 1991, the Directorate General of Machinery, Basic Metals, and Electronic Industry of the Ministry of Industry of the Republic of Indonesia selected SRI International in association with P. T. Unecona Agung to conduct the current study, with the objective of formulating a technology development plan that would cover a time frame of 10 years. This plan examines the supply-demand aspects of engineering technologies (products and process technologies) and defines action on policy, technical training and investment, and institutional support to strengthen the technological capability of the engineering subsector.

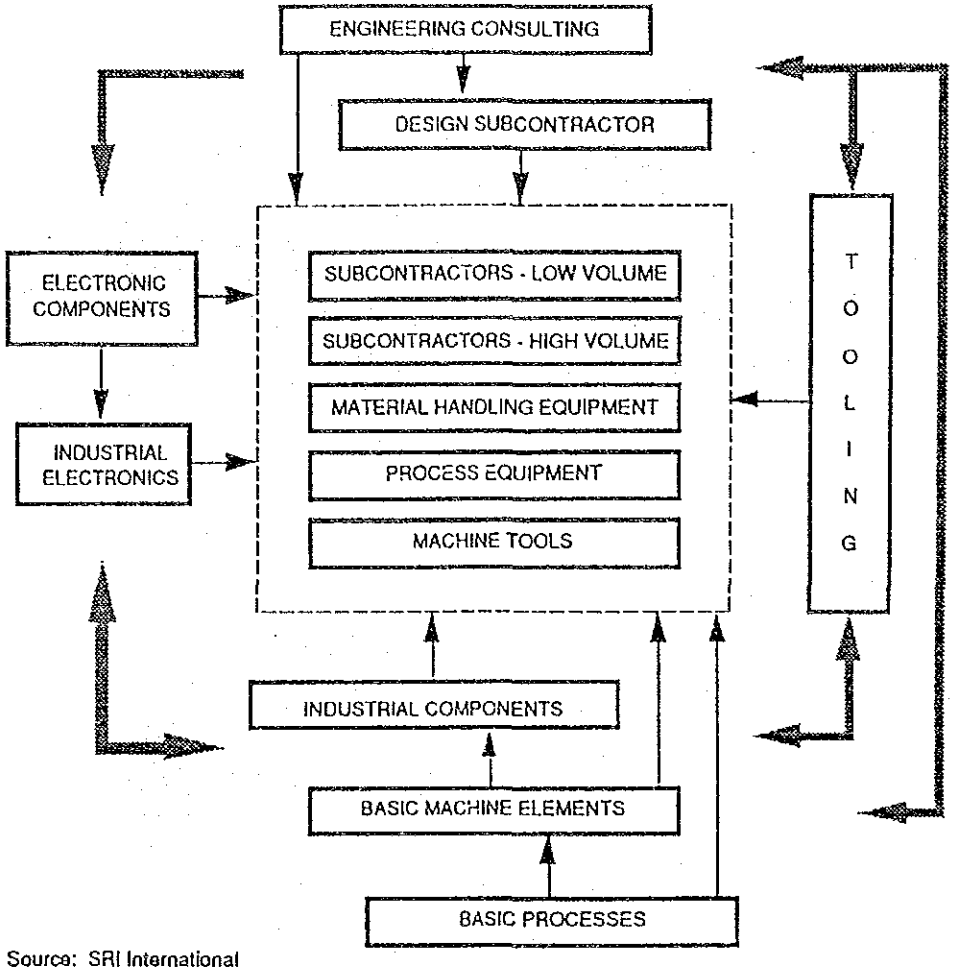
INTRODUCTION

As shown in Figure 1-1, the "engineering industry" is a complex group of individual enterprises (13 categories) engaged in the manufacture of industrial products (capital goods and intermediate products) and also, in some cases, offering engineering services. Significantly, the engineering industry has an intermediary position in the manufacturing chain (between raw material producers and final product manufacturers) and is therefore driven by the needs and success of other industries.

The engineering industry in Indonesia has its roots in the nineteenth century when large machine shops were established to provide spare parts and repair work to the many plantation processing mills. Although the average age of Indonesia's engineering industry enterprises is only 15 years, the historical base of many of these enterprises—34% of the total—continues to be repair workshops.

The industrialization of Indonesia and the growth of the automotive industry since the 1970s have altered the structure of the engineering industry from its original focus on process industries (such as palm oil or sugar mills and fertilizer plants) to a broader range of end-user industries (such as automotive, appliances, shipbuilding). Process industries still dominate, with 30% of enterprises devoted to this sector; however, 25% of the total now serve the automotive sector and 10% focus on the electrical/electronic sector. Other industry drivers are still minor, but they have great potential for growth. Agriculture, for example, represents only 5%, as do textiles and engines.

Not surprisingly given these data, 43% of the engineering industry's output is processing equipment and automotive components, and 50% of the technology base of the industry is related to fabrication, welding, and machining. Figure 1-2 provides a profile of the key products and technologies of the engineering industry in Indonesia.



Source: SRI International

FIGURE 1-1 STRUCTURE OF ENGINEERING INDUSTRY

At US$1.6 billion (this Indonesian government figure is probably high; SRI's definition of the engineering industry differs somewhat from the government's and therefore would likely be lower), the engineering industry's output is impressive; approximately 1,000 enterprises with 155,000 employees produce that level of output. Indonesian nationals own more than half (56%) of the enterprises, 16% are state owned, and the remainder have foreign involvement. The industry's facilities and equipment are generally adequate, but productivity is quite low, quality is highly variable, and industrial management and cost controls are lacking. The technology used within the industry is of great concern—unfortunately, it is not sufficient to support future growth of end-user industries in Indonesia.

I-2

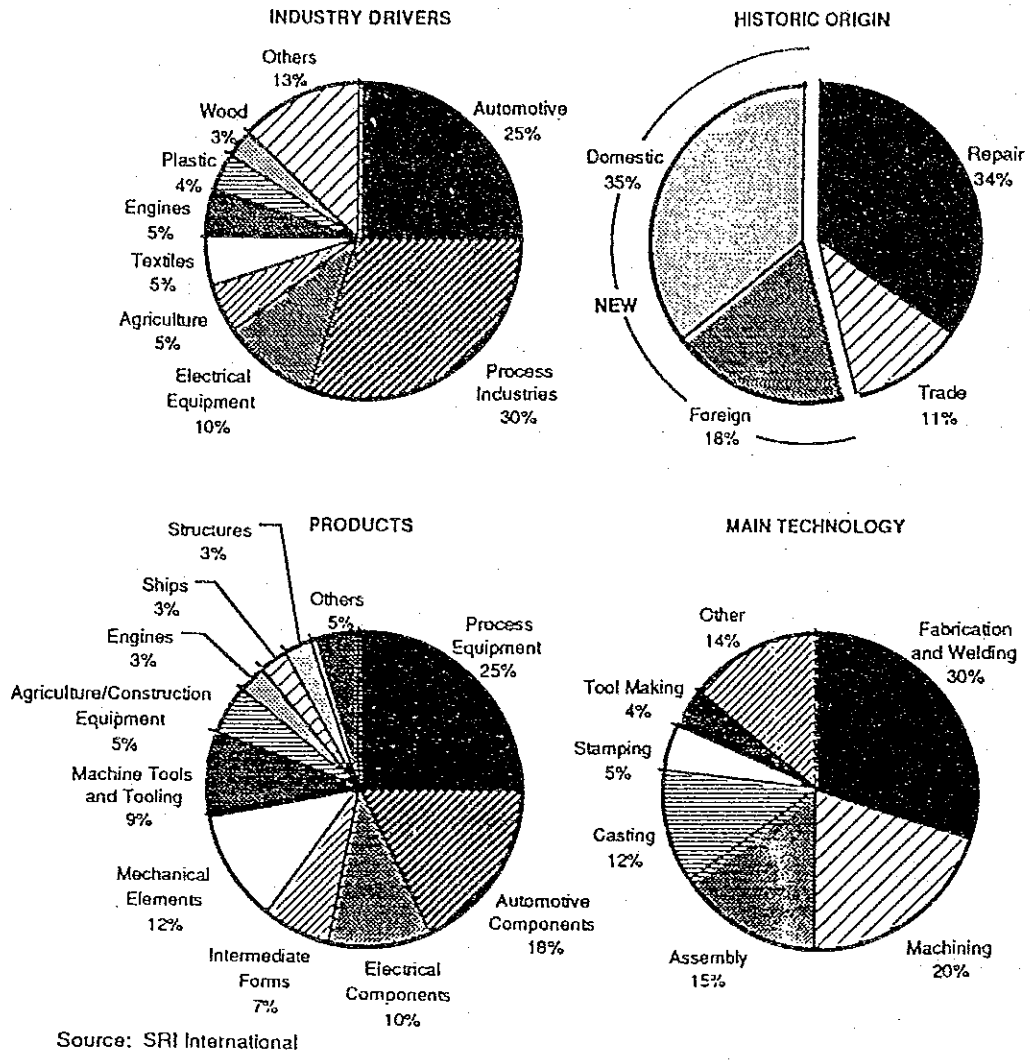


FIGURE 1-2 SELECTED CHARACTERISTICS OF THE ENGINEERING INDUSTRY IN INDONESIA

The engineering industry has significant technological gaps that inhibit its ability to supply products, and the end-user industry is still too small to create the level of demand needed to justify technological investment. In addition, foreign end users would rather source from their traditional foreign suppliers or vertically integrate; they site quality and delivery problems or economic issues as reasons for not developing local suppliers. Although SRI generally leans toward a free market theory, in this case government intervention is required to bridge the gap between suppliers and end users, helping them work together in ways that benefit both parties and the country's economy as a whole. Bridging the gap must proceed in two ways—through demand-pull and supply-push actions that both encourage end users to improve the capabilities of local suppliers and enable local suppliers to improve their own capabilities.

EXISTING TECHNOLOGICAL AND NONTECHNOLOGICAL CAPABILITIES

Technology can be defined as the knowledge needed to produce a given product or perform a given process. The industry's technology was evaluated at three levels: product, enterprise, and function.

At the product level, Indonesia's engineering industry has strengths in basic products, process equipment, and low-volume capital goods. A large gap exists, however, in a broad range of product technologies (see Table 1-1). Because of this gap, new industries have great difficulty establishing production in Indonesia.

Table 1-1
PRODUCT TECHNOLOGY GAP

Minimal Capability	Limited Capability
Powder metallurgy	Precision dies/molds
Heat treatment	Machine tools
Hydraulic/pneumatic equipment	Tubing/hose and fittings
Seals	Industrial drives, couplings
Sleeve bearings	Material handling systems
Electronic components	Burners
Industrial electronic products	Zinc die castings
Design subcontracting	Steel rolled forms
	Electrical components
	Special processing equipment
	High volume subcontracting

Source: SRI International

At the enterprise level, which deals with design, product, manufacturing, and industrial engineering technologies, manufacturing is the only area of strength—an expected finding because this is the easiest technology to purchase and establish. Capabilities in design technology and industrial engineering are minimal, primarily because of the evolutionary stage of Indonesia's engineering industry. Currently, the industry relies on licensed products with turnkey operations that do not require enterprises to involve themselves with product design and industrial engineering. Although this reliance may appear to be a very serious shortcoming, this is not necessarily the case. The licensing route is still the most effective way to build the engineering industry; however, Indonesia should start to develop its design and industrial engineering technology selectively. The selection process must be strategic and look toward eventual export opportunities. SRI recommends the development of 8 strategic design capabilities (see Table 1-2) and, in addition, recommends the development of 16 specific product and process technologies to support the expected end-user growth industries in the next 10 years (see Table 1-3).

At the functional level are the large number of individual functions that integrate each of the operational technologies of the enterprise. This know-how is quite limited, with most firms only sparsely performing various steps in the process. Much has to be done to improve this shortcoming.

Table 1-2
STRATEGIC PRODUCT DESIGN CAPABILITY

1. Agricultural equipment
2. Agricultural products process equipment
3. Textile processing equipment
4. Ships and marine equipment
5. Process engineering
6. General purpose, basic machine tools
7. Single cylinder, low cost, general purpose engines
8. Solid fuel burners

Source: SRI International

Table 1-3
PRODUCT AND PROCESS TECHNOLOGIES

1. Complex high volume iron castings
2. Semi-permanent aluminum molding
3. High volume, low cost forgings
4. High volume, low cost gears, shafts, sprockets, and pulleys
5. High strength fasteners
6. Seals and bearings
7. Fuel injection equipment
8. Insulation material
9. Precision plastic forms, molds, stampings, and dies
10. Electronic components
11. Low cost steel plate
12. Propulsion engines and marine gears
13. Controls
14. Pumps and compressors
15. Solenoid valves
16. Special mechanisms

Source: SRI International

Nontechnical issues also play an important role in the long-term success of the industry, and these areas have much room for improvement. Marketing, market knowledge, and exporting capabilities are quite low, and industrial management know-how (cost accounting, inventory control, production control, and shop performance) is almost nonexistent. Finally, the operating environment is not conducive to encouraging and supporting the growth of the industry. Sourcing materials and components is difficult and expensive, the physical infrastructure is largely underdeveloped, experienced human resources are scarce, financing is scarce and expensive, few sources of technology are locally available, and the domestic market for engineered products is still relatively small. SRI recommends the development of 8 areas of general improvement (see Table 1-4).

Table 1-4
GENERAL IMPROVEMENTS

1. Technical information
2. Educated and trained workforce
3. Adequate market
4. Improved operating environment
5. Lower cost capital
6. Improved productivity
7. Industry engineering know-how
8. Product design know-how

Source: SRI International

IMPORTANCE OF TECHNOLOGY TRANSFER

To overcome the engineering industry's weakness and to accelerate its growth, substantial transfers of technology from foreign sources are required. Fortunately, most of the industry's technologies are mature and well diffused among many manufacturers; they generally do not come out of research laboratories or other technology-developing institutions. In fact, many of the basic technologies are now commodities and thus readily available from many sources.

The key to developing technology in Indonesia's engineering industry is the effective transfer to recipients that are sufficiently experienced and skilled to understand and appreciate the nuances of a rather subtle and sophisticated process. Indonesia's engineers and industry lack this experience base. Human resource training is therefore a critical issue for the industry and the country. Seminars and special technology workshops to upgrade the engineering experience are essential. Motivating engineers to become more technically expert, especially in manufacturing engineering, is of prime importance. Other critical technology improvement support initiatives that need immediate attention are:

- Making available data and information dealing with sources of technology, both domestically and globally
- Providing support and guidelines regarding technology sourcing and negotiations
- Attracting foreign investors who will bring their technology.

Without additional support and action to help the industry overcome its weaknesses, the industry will likely only be able to achieve the moderate growth rate of about 5% to 6% annually (well behind the growth levels being experienced in other developing economies). During the next 10 years, therefore, the industry will grow from its current US$1.6 billion level to about a US$2.6 to US$3.2 billion level. Technology within the industry will improve but would mainly be centered within the foreign joint ventures. Substantial technological weaknesses will continue to persist in about 70% of the industry.

A more optimistic outlook is indeed possible and realistic. A growth rate of 10% to 15% annually can be targeted with total output of the engineering industry reaching US$4 billion to US$5 billion by the year 2002. What the engineering industry requires to achieve this growth, in approximate order of importance, is:

- *Increased demand (a bigger market)*
- More human resources (trained people)
- An improved operating environment
- Improved technical support
- Improved availability of capital.

A successful technology development plan is needed to help achieve these conditions and would result in a strong Indonesian engineering industry with the dimensions described in Table 1-5.

Actions leading to a general technical improvement of the engineering industry (and of many other manufacturing industries) include:

- Increased technological information availability
- Improved education/training of workforce
- Improved training of industry management and staff
- Support of a number of specific technical areas (see below).

Some of the specific technologies needing support are already available but must be improved to achieve a world-class level. These include foundry technology (ferrous and nonferrous) and steel fabrication (structural, pressure vessels, heat exchangers, etc.). Several other of these technologies, however, must be developed from their current very low (or nonexistent) level, and include:

- Forging—acquire missing elements and develop them
- Heat treatment—acquire missing elements and develop them
- Powder metallurgy—acquire and develop
- Fluid sealing—acquire at least application engineering know-how
- Hydraulic/pneumatic systems—acquire at least application engineering know-how
- Control systems—acquire at least application engineering know-how.

In addition, several more complex engineering capabilities need to be mastered; these include:

- Design of production mechanization/automation systems
- Design of a number of specific products (see Table 1-2)
- Industrial/manufacturing engineering
- Large project management/engineering.

Table 1-5

VISION OF INDONESIA'S ENGINEERING INDUSTRY IN THE 21ST CENTURY

I. The engineering industry becomes a stronger supplier of textile machinery to the domestic market, through:
   - Primarily weaving equipment (looms)
   - Secondarily, finishing and yarns processing equipment.

II. The tooling (dies, molds, jigs), foundry, and forging industries develop their products and processes to the "export quality" level and achieve substantial export volume by the end of the period.

III. The process equipment manufacturing industry upgrades its technology and:
   - Achieves significant exports in Pacific area
   - Continues to serve the domestic industry with substantial demand.

IV. The automotive industry in Indonesia is restructured and succeeds in generating significant exports (to offset imports); the engineering industry becomes an important supplier and achieves competitive production volumes in some selected components.

V. The demand for mechanized agricultural equipment (tilling, harvesting, after-harvest) increases substantially, and domestic manufacturers meet the bulk of the need; the engineering industry, especially spin-offs from the automotive sector, becomes the core base of this industry.

VI. A significant consumer electronic industry is established, and the engineering industry becomes an important subcontractor (supplier) to it.

VII. A significant shipbuilding industry is established, with global exports as an important part of its production. The engineering industry becomes an important subcontractor (supplier) to it.

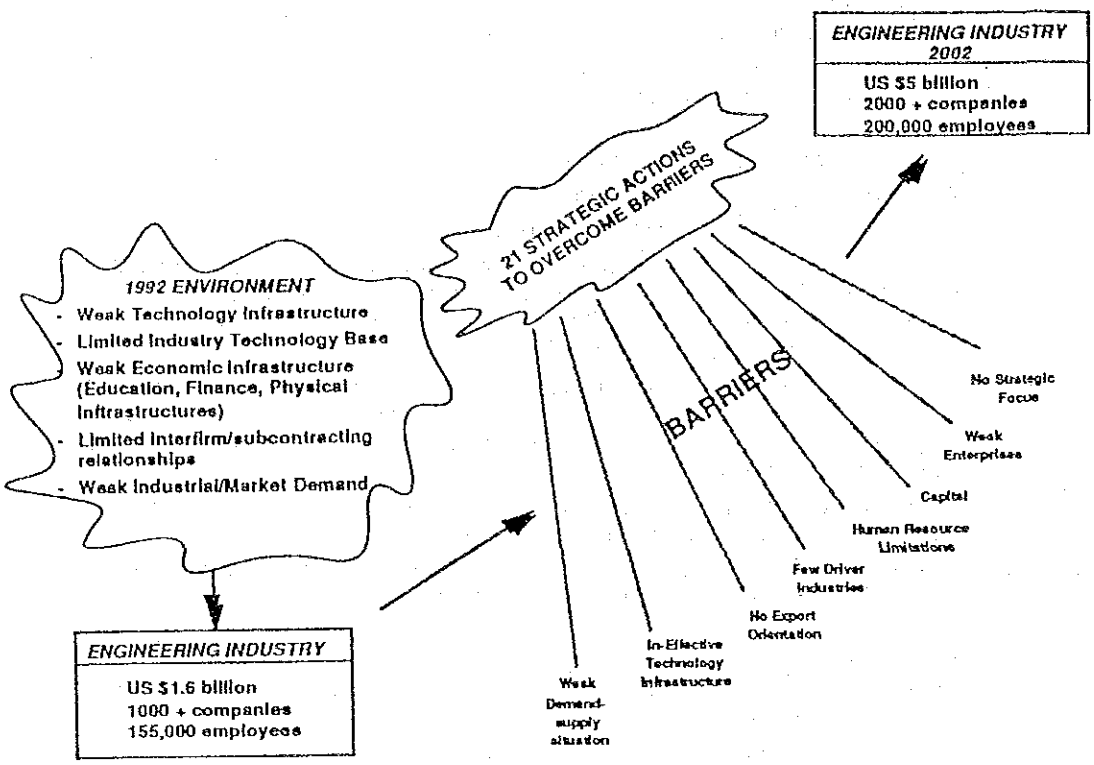
VIII. Indonesian engineering firms win large process engineering design contracts on the basis of their extensive experience in energy, petrochemical, chemical, and other process industries in Indonesia.

IX. Some other new industry(s) grows, providing additional important drivers to the engineering industry.
   - Telecommunications?
   - Electrical equipment?

Source: SRI International

TECHNOLOGY DEVELOPMENT PLAN

Figure 1-3 provides a vision of change—21 strategic actions that will help overcome a set of barriers that are inhibiting growth. Table 1-6 characterizes the type of barriers that exist within the four quadrants that link relationships of firm-focused and business climate focused barriers to demand-pull and supply-push factors.



Source: SRI International

FIGURE 1-3 TECHNOLOGY DEVELOPMENT PLAN FOR THE 21ST CENTURY

Table 1-6
BARRIERS TO ENGINEERING INDUSTRY TECHNOLOGY DEVELOPMENT

	Firm-Focused Barriers	Business Climate Focused Barriers
Demand-Pull Factors	• Insufficient demand from vertically integrated end-user firms: - State enterprises in process industry - Private enterprises in automobile industry • Insufficient demand from firms competing in global markets - Textile firms that import rather than buy Indonesian engineering industry products	• Insufficient overall domestic market for engineering industries • Virtually no global market for engineering industries • Insufficient internal industry demand for improving technical skills, conducting R&D of any kind
Supply-Push Factors	• Insufficient technical information and assistance in key areas • Inadequate industrial engineering and management skills • Inadequate technical skills in key areas • Insufficiently responsive raw material, parts, etc., suppliers • Insufficient technology transfer from end-user industries and public institutions	• Inadequate skilled labor pool in Indonesia • Insufficient capital available at reasonable cost • Unnecessarily burdensome regulatory processes • Inadequate physical infrastructure

Source: SRI International

Summary of Institution and Policy Assessment

SRI's analysis of the quadrants in Table 1-6 have led to the following conclusions.

1. Indonesian policies have focused more on "supply push" factors than on "demand pull" factors. Therefore, the demand conditions that are necessary for technology development are limited. These limitations include:
   - Weak market pull from industry drivers on engineering industries
   - High degree of vertical integration; weak demand for outsourcing
   - Foreign partners not transferring technology and skills
   - Licensing difficulties for smaller firms
   - ISO or SNI standards rarely used
   - High NTB's on basic inputs raising costs for engineering industries
   - Local content policies do not necessarily encourage local value added
2. The technology infrastructure is fragmented, and engineering industry firms are not receiving the skills, assistance, and information they need:
   - BPPI (MIDC), TSG, BPPT, PUSDATA, LIPI, PMS-ITB each assist with technology acquisition independently

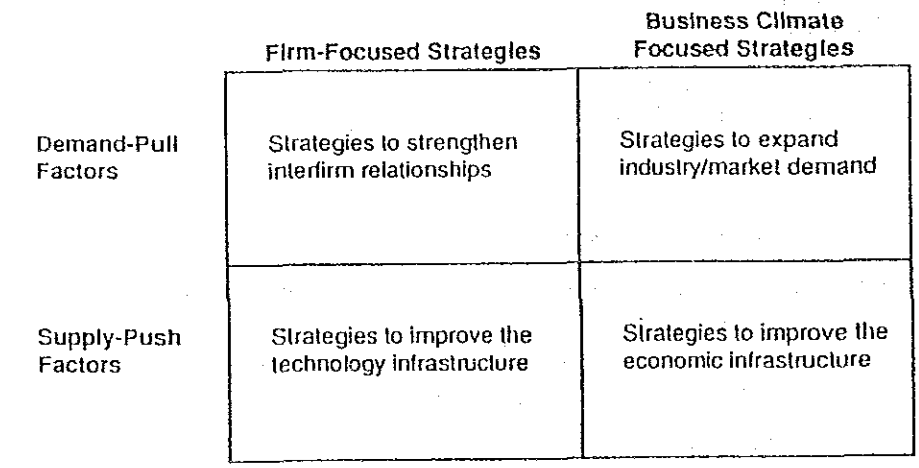
- Eleven government organizations exist to help firms assimilate technology through technical assistance and training
- Four government organizations assist with technology improvement with limited effect.

3. MOI generally behaves as a direct provider of services (i.e., a "retail store"), rather than as a creator of positive incentives, a facilitator of activities, a convener of groups, and a broker of information (i.e., as a "wholesale store").

   Consequently, current MOI efforts are not achieving widespread results in the private sector.

   MOI needs to move away from its adversarial role as industry monitor and regulator and move toward the more proactive role of encouraging demand for technology development and helping the technology infrastructure meet industry demand.

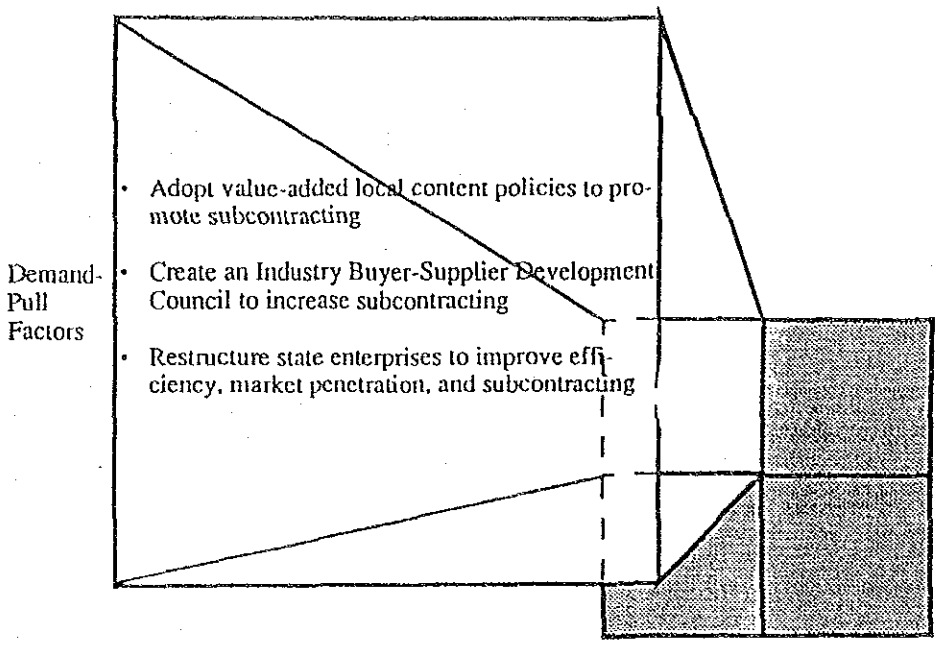
Figure 1-4 shows the strategic framework SRI used as the basis for the Technology Development Plan (TDP), to address the above-mentioned barriers.



Source: SRI International

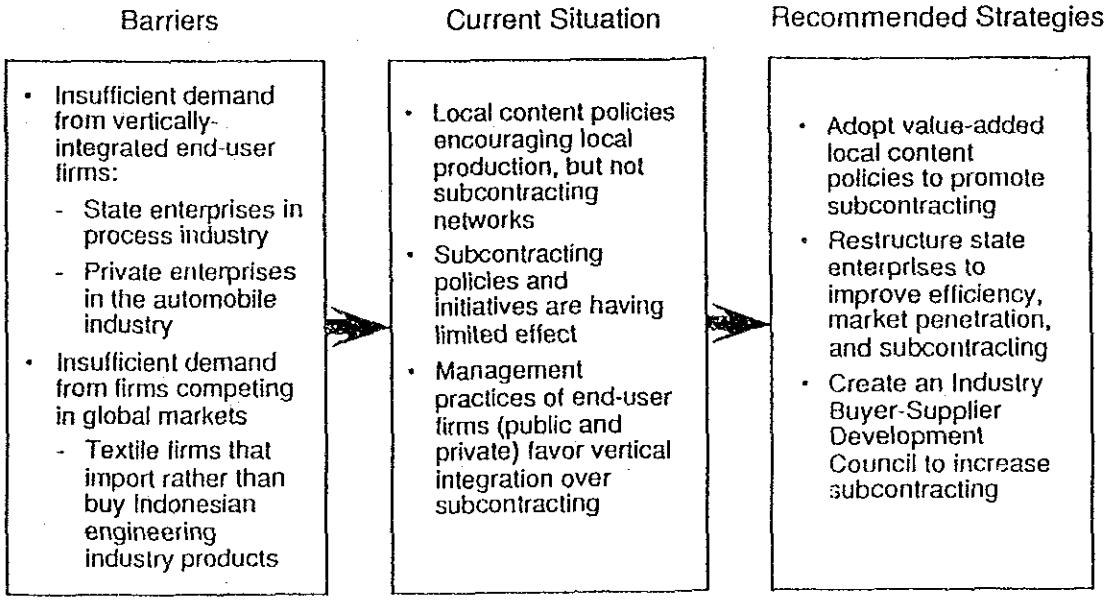
FIGURE 1-4 STRATEGIC FRAMEWORK FOR TDP

Figures 1-5 to 1-12 and Tables 1-7 to 1-11 identify the key strategies, rationale, and implementation plans for each quadrant.



Source: SRI International

FIGURE 1-5 KEY STRATEGIES TO STRENGTHEN INTERFIRM RELATIONSHIPS



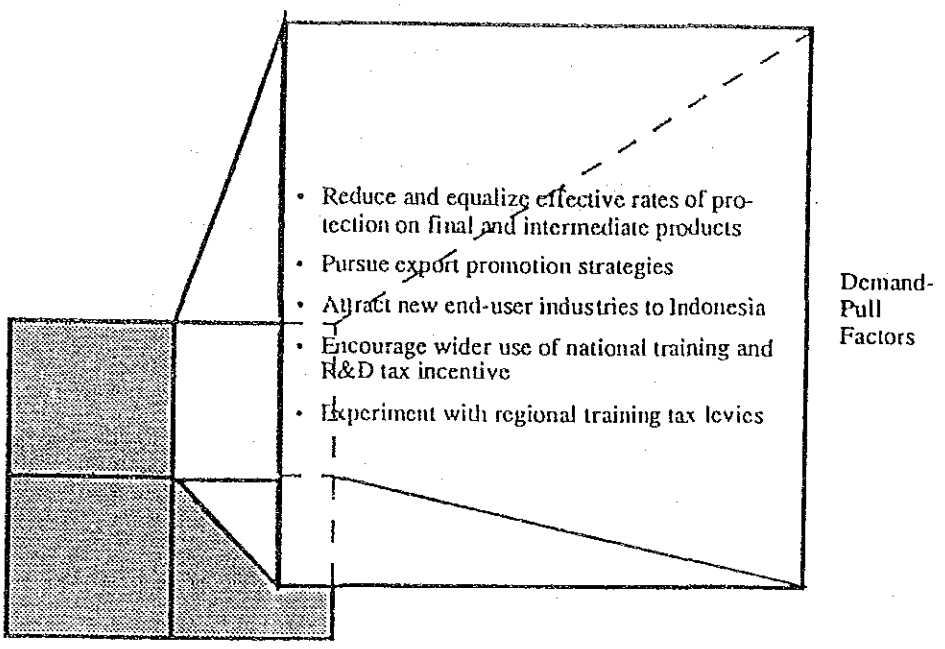
Source: SRI International

FIGURE 1-6 RATIONALE FOR STRENGTHENING INTERFIRM LINKAGES

Table 1-8
IMPLEMENTATION OF INTERFIRM-STRENGTHENING STRATEGIES

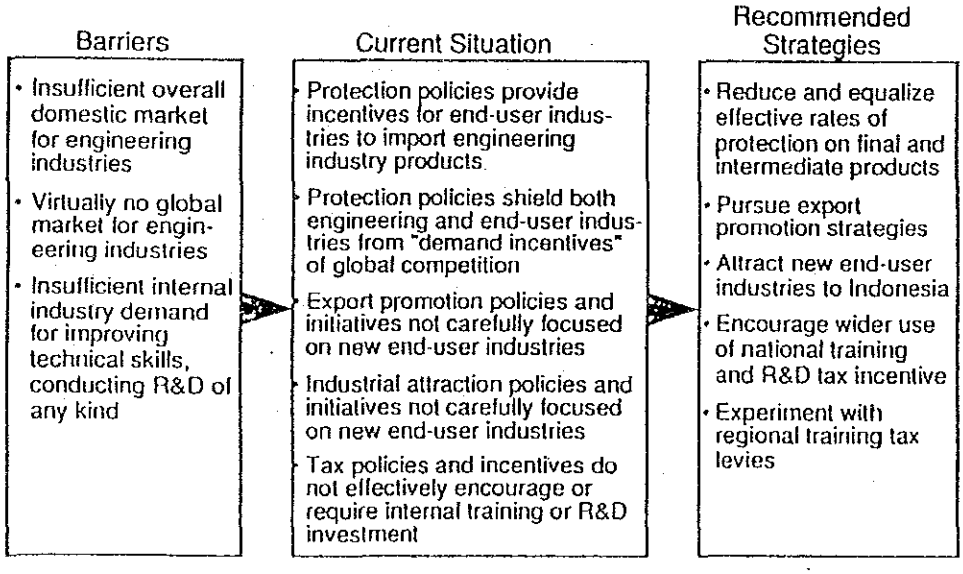
Strategy and Action Steps	Roles and MOI Cost
• Adopt value-added local content policies to promote subcontracting 1. Study similar approaches worldwide 2. Determine appropriate percentages by industry 3. Set standards for both state enterprises and private companies	Lead Role: MOF, MOI *Support Roles: Industry, consultants* MOI Cost: Minimal
• Restructure state enterprises to improve efficiency, market penetration, and subcontracting 1. Reduce management constraints, encourage risk-taking and export orientation 2. Spinoff certain workshops as independent suppliers	Lead Role: MOI Support Roles: State enterprises MOI Cost: US$1 million
• Create an Industry Buyer-Supplier Development Council to increase subcontracting 1. Create data bases on buyer specifications and supplier capabilities 2. Assemble data base and directory of TA and training options 3. Develop joint buyer-supplier training programs, workshops, and TA initiatives	Lead Role: MOI Support Roles: MOM, MOT, MOF, BPPT, MIDC, B4T, state enterprises, GAMMA and its affiliates, end-user industry associations, industry firms MOI Cost: Tap IWPL funds for training as needed, otherwise minimal

Source: SRI International



Source: SRI International

FIGURE 1-7 STRATEGIES TO EXPAND END-USER MARKETS



Source: SRI International

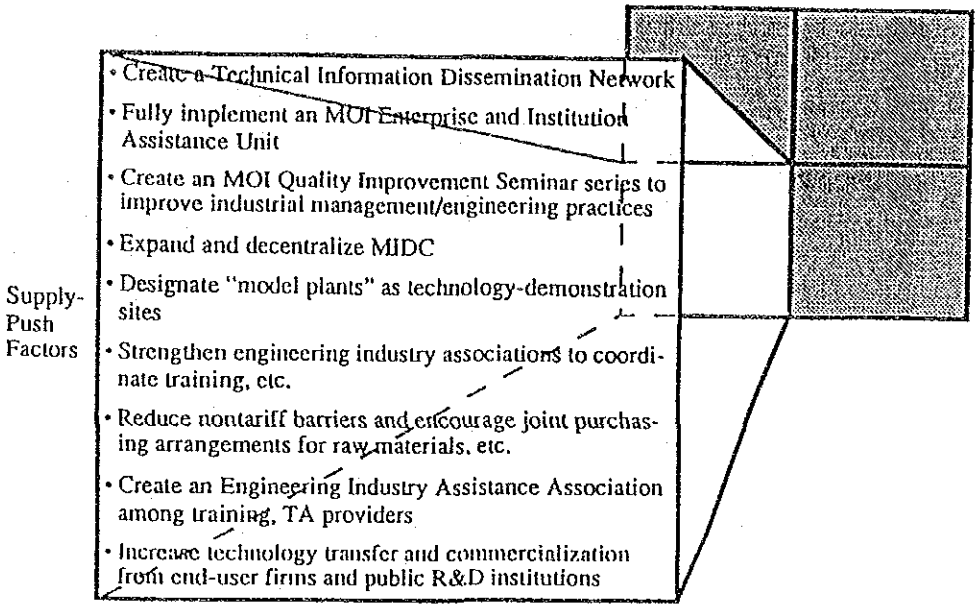
FIGURE 1-8 RATIONALE FOR STRENGTHENING END-USER MARKETS

Table 1-9

IMPLEMENTATION OF STRATEGIES FOR STRENGTHENING END-USER MARKETS

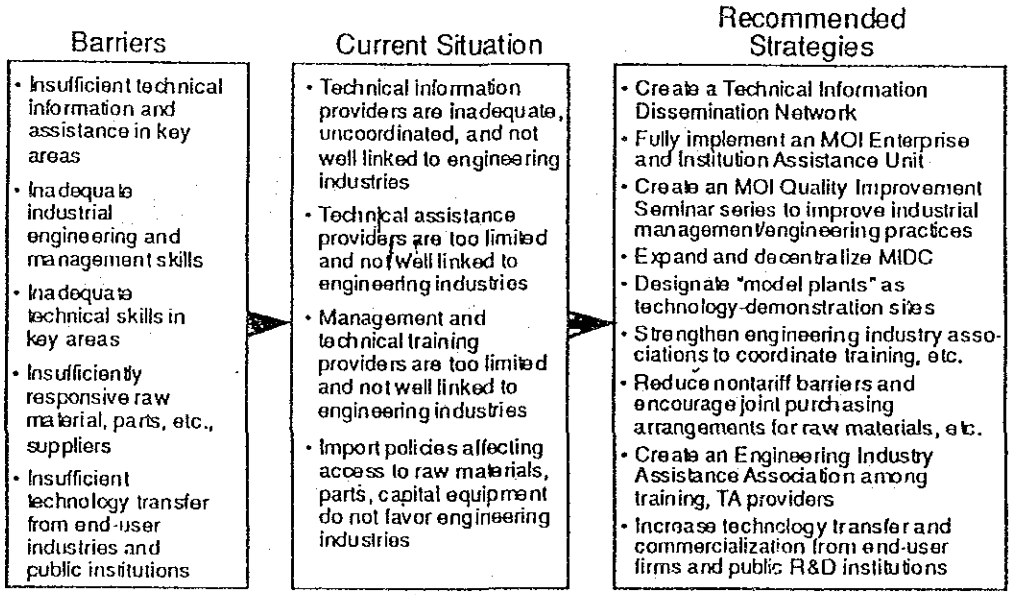
Strategy and Action Steps	Roles and MOI Cost
• Reduce and equalize effective rates of protection on final and intermediate products 1. Develop and publish 10-year timetable for closing ERP gaps 2. Develop and publish timetable for lowering ERPs to ASEAN standards 3. Publicize availability of "transition assistance" for firms that are losing protection or gaining possible new markets	Lead Role: MOI Support Roles: Industry associations MOI Cost: Minimal
• Pursue export promotion strategies 1. Work with MOF to increase incentives for first-time exporters 2. Work with MOT/ NAFED to develop targeted export initiatives 3. Link suppliers with export-oriented end-user industries (e.g., textiles) to develop export quality	Lead Roles: MOI, MOT Support Roles: Industry associations, MOF MOI Cost: Minimal (Tap MOT export funds)
• Attract new end-user industries to Indonesia 1. Conduct study of best end-user industry attraction candidates 2. Develop targeted attraction initiatives	Lead Role: MOI Support Roles: Industry associations, firms MOI Cost: US$500,000 for study
• Encourage wider use of national training and R&D tax incentive 1. Work with MOF to develop information campaign on using R&D/training tax credit 2. Monitor use of tax credit over time to improve targeting	Lead Roles: MOI, MOF Support Roles: Industry associations MOI Cost: Minimal
• Experiment with regional training tax levies 1. Evaluate the East Java regional tax levy for training 2. Consult other countries with experience (e.g., Singapore) 3. Encourage pilot efforts in other regions	Lead Roles: MOI, MOF Support Roles: Regional governments, foreign governments MOI Cost: Minimal

Source: SRI International



Source: SRI International

FIGURE 1-9 KEY STRATEGIES FOR IMPROVING TECHNOLOGY INFRASTRUCTURE



Source: SRI International

FIGURE 1-10 RATIONALE FOR TECHNOLOGY INFRASTRUCTURE STRATEGIES

Table 1-10
IMPLEMENTATION OF TECHNOLOGY INFRASTRUCTURE STRATEGIES

Strategy and Action Steps	Roles and MOI Cost
• Create a Technical Information Dissemination Network (TIDN) 1. Establish telephone hotline at MOI; link to MIDC network, GAMMA, PUSDATA, LIPI, others 2. Publish directory of local and international sources of info and assistance 3. Form inter-agency task force to assist firms with technology licensing; publish guide 4. Establish technical libraries at the 4 MIDC testing centers	Lead Role: MOI Support Roles: MIDC, BPPT, LIPI, Industry Associations MOI Cost: US$1.5 million to US$2 million
• Fully implement an MOI Enterprise and Institution Assistance Unit 1. Boost implementation of TSG 2. Add parallel Institution Services Group that trains trainers 3. Hire foreign consultants	Lead Role: MOI Support Roles: MIDC, B4T, polytechnics, universities, industry associations, international donors MOI Cost: US$6 million
• Create an MOI Quality Improvement Seminar series to improve industrial management/engineering practices 1. Bring in internationally renowned experts on Continuous Quality Improvement 2. Publicize seminar times and locations 3. MIDC, PMS, others license teaching materials for follow-up training	Lead Role: MOI Support Roles: Public and private trainers MOI Cost: US$1 million
• Expand and decentralize MIDC 1. Expand capacities at each MIDC regional testing center 2. Establish organizational and electronic linkages between centers	Lead Role: MOI, MIDC Support Roles: International Donors MOI Cost: US$3 million to US$4 million
• Designate "model plants" as technology-demonstration sites 1. Certify model plants and present manufacturing excellence awards 2. Arrange plant tours, seminars, and demonstrations	Lead Role: MOI Support Roles: Industry, Ministry of Manpower MOI Cost: Minimal
• Strengthen engineering industry associations to coordinate training, etc. 1. Co-host symposium with GAMMA to identify critical training needs and issues 2. Assist GAMMA and member associations in developing training and other assistance programs	Lead Role: MOI Support Roles: Ministry of Manpower, industry associations MOI Cost: US$1 million to US$2 million

Table 1-10 (Continued)
IMPLEMENTATION OF TECHNOLOGY INFRASTRUCTURE STRATEGIES

Strategy and Action Steps	Roles and MOI Cost
• Reduce nontariff barriers and encourage joint purchasing arrangements for raw materials, etc. 1. Advocate for continued reform of NTB's 2. Assemble groups of engineering firms into purchasing coalitions 3. Provide technical assistance in establishing shared purchasing and distribution centers	Lead Role: MOI, Ministry of Finance Support Roles: MIDC, GAMMA, training providers MOI Cost: Minimal
• Create an Engineering Industry Assistance Association among training, TA providers 1. Provide guidelines and assistance to centers for creating formal marketing plans, brochures, budgets, etc. 2. Subsidize consultants to work with institutions 3. Require % of budgets be used for shared purposes	Lead Role: MOI, Ministry of Education Support Roles: MIDC, B4T, Polytechnics, universities MOI Cost: US$0.5 million to US$1 million
• Increase technology transfer and commercialization from end-user firms and public R&D institutions 1. Establish technology commercialization offices at each public R&D institution 2. Set up national Technology Commercialization Corporation to provide matching grants to public-private R&D teams 3. Host high-profile design contests 4. Arrange for "early adopter" firms to lead workshops and establish partnerships with firms and institutions.	Lead Role: MOI, BPPT, Ministries of Education, Finance Support Roles: Ministry of Manpower, MIDC, Polytechnics, Universities, International donors MOI Cost: US$0.5 million to US$1 million

Source: SRI International

６ ：収集資料リスト

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1) Electricity Supply by PLN in Brief 1989/1990－1990/1991

2) Basic Tariff of Electricity 1993

3) PLN Financial Statistics 1990/91

4) PLN Statistics 1991/92

5) Answers to JICA's Questionnaire (2 September 1993) (質問票に関する解答)

6) Feasibility Study on the Development of Poko and Bakaru Stage II Hydro Power Project Teams of Reference (来年度要請予定案件のTOR)

7) 1968/69 S/D 1992/93 (Maret 1993)

8) Historical Data (Region XIII)

9) Sub Station Forecast for Ujung Pandang System

10) Pre Feasibility Study of UJUNG PANDANG Steam Power Plant Project

２．鉱山エネルギー省

1) Kampanye Hemat Energi National

2) The Application form Japan's Development Survey (Survey on the Rational Use of Energy)
(省エネルギー 案件のTORドラフト)

３．工業省

1) Explanatory Notes

2) Executive Summary

3) Technical Assistance Proposal （セラミック、大使館に提出予定）

1) Technical Assistance Proposal （工業標準化、大使館に提出予定）

2) MOI 機構図　　1枚

3) MOI - Pustan機構図　　1枚

4) BDDI -研究所　　1枚

5) 国家認定システム概要　　2枚

6) UNDP調査／EC協力／世銀プロジェクト・各概要

４．ＬＩＰＩ

1) Standardization Council of Indonesia(SDN概要パンフレット)

2) 認定システム（インドネシア語）