Java-Bali Power Sector Restructuring and Strengthening Project

Environmental & Social Assessment and Management Plan

March 2003

PT. PLN (PERSERO)
SUMMARY

1. Introduction: The Project, Assessment, and EMP

This combined Environmental and Social Assessment and Environmental Management Plan has been prepared by PT Perusahaan Listrik Negara (PT PLN Persero) with consultant support provided by the World Bank as part of joint preparations for the proposed Java-Bali Power Sector Restructuring and Strengthening (JBPSRS) Project.

As discussed with Bank planning missions in November 2001 and May 2002, the JBPSRS Project would be a Sector Investment Loan (SIL). The loan would provide financing for a range of critical projects under PLN’s Limited Scenario (2002-2006) for Java-Bali. Major types of subproject activities covered by the loan package include:

- **Relieving Constraints in the Bulk Transmission System**, which will improve power supply to the Cirebon area and to the southern part of Central Java,

- **Improving Availability and Security of Generation Capacity**, by improving the transmission system from the geothermal power plants at Wayang Windu, Kamojang and Drajat in West Java;

- **Strengthening Local Transmission and Subtransmission Systems**, including in Cirebon, Surabaya, Bandung, and Bali.

These activities will all improve the existing transmission system, and thereby provide significant social and economic benefits to the people of Java-Bali. However, PLN appreciates the need for comprehensive analysis and mitigation of potentially adverse or negative impacts to the surrounding environment and communities. From past experience, PLN has learned that it is less costly to prevent, avoid, and mitigate problems than to be confronted by them after the fact. Equally important, PLN’s activities are subject to Indonesia’s national environmental assessment regulations. And PLN understands that activities supported under a World Bank loan need to comply with the Bank’s policies and guidelines for environmental and social safeguards.
THIS ASSESSMENT AND EMP

From May-September of 2002, the Bank provided expert consultant support to PLN for the purpose of conducting an environmental and social assessment of the planned activities and preparing an environmental management plan (EMP) and a Land Acquisition and Resettlement Policy Framework.¹ This report documents the findings of that consultancy.

As a Sector Investment Loan, the final set of activities to be supported may be adjusted after the signing of the loan agreement to meet PLN’s evolving priorities and opportunities. Therefore the objectives of this EMP are not just project specific, but also process-oriented – concerned with PLN’s transmission work in general, and also with the effectiveness of environmental management in PLN’s operations.

In addition to this Summary and several Annexes, the eight chapters of the report are organized into four sections:

- **Part I -- Policy, Legal, and Administrative Framework** (Chapters 1-3), provides information on the environmental assessment and mitigation requirements of both the Indonesian government and of the World Bank, and on PLN’s history and current situation for environmental assessment and management;

- **Part II -- Project Description and Assessment of Likely Impacts** (Chapters 4-5);

- **Part III -- Environmental Management Plan** (Chapters 6-7), describes the process for ongoing environmental screening within the project, as well as for mitigation measures and reporting; also, a 5-year program for strengthening PLN’s capacity for environmental management is proposed.

- **Part IV -- Note on Harmonization of Environmental Procedures**, provides a concluding thought toward encouraging unification of international and Indonesian environmental assessment procedures.

¹ The expert team was provided by Nexant, Inc., a Bechtel-Affiliated Energy Management Services Consultancy. Members of the Assessment Team, and a summary of their Terms of Reference, are listed in Annex A.
2. Likely Impacts

Adverse environmental and social impacts of all of the planned subprojects are likely to range from minor to negligible.

The proposed activities consist of replacing or uprating the conductors on existing transmission lines and expanding existing substations. For all subprojects as currently envisaged in the Project, PLN already owns or has access rights to all of the land involved; therefore there will be no associated need for land acquisition or resettlement, and no dwellings, enterprises, or buildings will be adversely affected. However, any land acquisition and compensation which may arise for subprojects to be prepared during project implementation will be undertaken in accordance with the Project’s Land Acquisition and Resettlement Policy Framework. There are no polychlorinated biphenyls (PCB’s) involved, and there will be only limited increases in exposure to electromagnetic fields (EMF). Principal concerns relate to traffic control during rewiring, disposal of old equipment, coordination of activities with other departments, and public information and relations with communities where the subprojects would occur.

3. Environmental Management Plan

The JBPSRS Project has been categorized under World Bank environmental guidelines as a Category B, or low impact, project.

As a Category B Project, a full EMP is not normally required. However, since under current regulation by Ministry of Environment Decree No. 17/2001 requires an AMDAL study for every 150 kV transmission project, then PLN will carry out an EIA, even though it is likely that these subprojects will only have minor impacts.

PLN has established a Project Implementation Unit (PIU) with overall responsibility for coordination and management of the project, under the Director’s Decree No. 134.K/010/DIR/2002, dated 18 September 2002. There is a Project Environmental Team (PET) under the PIU that will oversee and coordinate all aspects of this EMP, as well as the Land Acquisition and Resettlement Policy Framework.

- Subprojects will be implemented as field operations, under the respective operational units. The PET will work under the direction of the leader of the PIU.

In Chapter 7, creation of a corporate CHESS (Community/Health/Environment/Systems/Sustainability) Group is proposed. The Director of that group would also be represented on the PET. The CHESS Group would be available to provide technical support, training, and monitoring support as needed.

Relations between the project management team, PLN management, and the World Bank and the government are shown in Figure 1.
SCREENING OF SUBPROJECTS:
The PET will have the on-going task of environmental screening of any additional subprojects or activities to be funded under the project.

For all of the subprojects in the initial list as contained in Chapter 4, the World Bank environmental category would be B. However, under Indonesian AMDAL criteria, there are three subprojects which require an AMDAL study (Perak-Ujung, Band. Sela-Kamj-Drajat-Ciamais, and W. Windu Incomer). The PET needs to confirm that for any changes or additions to the proposed subprojects, an appropriate review is conducted to ensure that any associated impacts are consistent with the World Bank’s Environmental Category rating of B.

AMDAL ASSESSMENTS:
The PET will oversee any needed AMDAL studies in collaboration with the implementing PLN project operations units.

If either ANDAL-RKL-RPL or UKL-UPL are needed, the PET will review the terms of reference, and provide advice and support to the implementing unit. The PET will also review the results of any such studies to ensure that they are satisfactorily completed and ready for submission to the relevant AMDAL Commission.

PUBLIC CONSULTATION:
Public consultation with affected communities is now required in the screening and TOR preparation of AMDAL studies, and the affected public are represented in the AMDAL Commissions that review the ANDAL/RPL/RKL studies.

During the preparation of this assessment, PLN convened a public consultation in Surabaya concerning the planned Perak-Ujung transmission line uprating project. This meeting,
reported on in Annex D, provides a model for consultations that may be conducted in the future for this (and other) project activities. In addition, the Ministry of Environment with World Bank support is preparing guidelines for public consultation under the AMDAL process.

MITIGATION OF IMPACTS

PLN’s established procedures for designing, constructing, and maintaining transmission lines are summarized in its General Policy Concerning the Establishment of Overhead Transmission Lines (reproduced here in Annex E) and have been incorporated into this EMP. The General Policy addresses public participation, compensation and rehabilitation of property, and general mitigation measures. This policy has previously been reviewed and approved by the World Bank. The existing General Policy provides adequate guidance for activities planned under the JBPSRS Project. But the General Policy is in need of updating and expansion in scope. This could be done during implementation of the project’s Environmental Management Development Component. Specific policies and procedures applicable to any land acquisition and compensation which may arise during the course of project implementation are addressed in the General Policy and this EMP, but have also been collated in a stand alone Land Acquisition and Resettlement Policy Framework (as is required under World Bank Safeguard Policies and Procedures).

MONITORING AND REPORTING

Environmental monitoring for the JBPSRS Project will be under the authority of the PET.

The PET’s team leader should receive copies of all progress and other reports required under the AMDAL process, and share them with all members of the PET.

In addition to the AMDAL reports, which are to be submitted as required to Indonesian agencies, the PET will prepare, every six months, an environmental summary report. This report will be submitted in English to the World Bank environmental officer in Jakarta, and copied to the Bank’s project manager. This report would briefly describe:

- a list of new subprojects developed or approved for implementation, and the categorization of their likely environmental impact;
- a summary of progress of any AMDAL studies in progress;
- a summary of significant mitigation measures, if any, undertaken during the previous six months;
- a description of any significant problems or successes in environmental mitigation during the period; and
- identification of any notable environmental or social events anticipated during the coming six months.
4. Institutional Strengthening

In the mid-1980s, PLN maintained an Environmental Committee, and the newly created Engineering Group included an environmental specialist group, which had responsibility for PLN's obligations to meet national and other environmental regulations.

In 1995, PLN's Environment Division (DIVLING) was established under the Directorate of Operations. A World Bank loan funded an 18-month capacity building program to "strengthen PLN's environmental management capabilities" in 1997-98. Several guidelines and procedures were established.

In October 2001, the Environment Division was dissolved, and most environmental management responsibilities were devolved to field operation units, in accord with corporate-wide decentralization.

In the future, PLN is to function as a central holding company for a number of subsidiaries and business units. Each of these groups will need to comply with AMDAL requirements and Indonesian environmental standards. PLN not only needs to strengthen the capabilities of these individual units, it needs to provide clear corporate leadership for environmental excellence in the Indonesian electric power industry. If it fails to do so, it risks losing the confidence of the Indonesian public, of international financial institutions and other investors, of communities and individuals who may be affected by specific projects, and of the Ministry of Environment and of local governments who must approve its plans and monitor their implementation.

Therefore, the JBPSRS project should include a 5-year Environmental Management Development (EMD) Program. This EMD component will include a combination of technical assistance, information technology, and training. As outlined in Chapter 7, this EMD would have three Task Clusters, matching the three objectives for the component:

i) JBPSRS Project Monitoring and Support;

ii) AMDAL, International EIA, and Public Consultation Strengthening and Support; and

iii) Environmental Management Systems and Training.

5. Harmonization of Environmental Procedures

PLN has received loans and funding support from the World Bank, and from the Asian Development Bank (ADB) and the Japanese Bank for International Cooperation (JBIC). Each of these financial institutions has their own distinct set of environmental regulations and requirements for project lending. As a result, PLN approaches each new IFI-supported project and its concomitant environmental and social assessment and mitigation procedures on an ad hoc basis.

In recent years, Indonesian AMDAL requirements have also become more comprehensive. With the decentralization of governance generally, oversight of the AMDAL process has also been
decentralized. AMDAL reviews are now conducted and decided at the local level, with participation of local stakeholder representatives. In addition, under the recent AMDAL revisions, public consultations are required. Generally speaking, the AMDAL requirements are as comprehensive and rigorous as those of the IFIs, sometimes more so.

It would seem to be to everyone’s advantage if all of the principal IFIs were to accept that Indonesia’s AMDAL procedures provide a satisfactorily high standard of environmental assessment process.

If the IFIs were to recognize and accept this principle, it would simplify the environmental planning, assessment, implementation, and reporting requirements for PLN and its business units. Of course, quality assurance for preparation of AMDAL reports, as well as performance of mitigation measures of any environmental management plan, must be an ongoing process.
# JAVA-BALI POWER SECTOR RESTRUCTURING AND STRENGTHENING PROJECT

*Environmental & Social Assessment / Environmental Management Plan*

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Acronyms and Abbreviations Used

AMDAL Analisis Mengenai Dampak Lingkungan Hidup -- Analysis of Impacts on the Living Environment
ANDAL Analisis Dampak Lingkungan – Environmental Impact Analysis
BAPEDAL Badan Pengendalian Dampak Lingkungan Hidup - Environmental Impact Management Agency
BAPEDALDA Badan Pengendalian Dampak Lingkungan Hidup Daerah - Regional Environmental Impact Management Agency
DIVLING Divisi Lingkungan – PLN’s Environment Division
EIA environmental impact assessment
EMD Environmental Management Development (Project)
EMF electromagnetic fields
EMP Environmental Management Plan
EMS Environmental Management System
ICNIRP International Commission on Non-Ionizing Radiation Protection
IFI international financial institution
ISO International Standards Organization
JBPSRS Java-Bali Power System Restructuring and Strengthening (Project)
LH (Menteri) Lingkungan Hidup - Ministry of Environment
MNKLH Menteri Negara Kependudukan Lingkungan Hidup -- Ministry of State for Population and Environment
NGOs Non-Governmental Organizations
PCBs polychlorinated biphenyls
PET Project Environmental Team
PIU Project Implementation Unit
PLN PT Perusahaan Listrik Negara
RKL Rencana Pengelolaan Lingkungan –Environmental Management Plan
RPL Rencana Pemantauan Lingkungan – Environmental Monitoring Plan
SIL Sector Investment Loan
SOP Standard Operating Procedure(s)
UKL Upaya Pengelolaan Lingkungan -- Environmental Management Procedures
UPL Upaya Pemantauan Lingkungan -- Environmental Monitoring Procedures
WHO World Health Organization
PART I

Policy, Legal and Administrative Framework
Chapter 1

THE EVOLVING AMDAL SYSTEM AND REGIONAL AUTONOMY

The framework for Indonesia’s environmental assessment system management began to take shape with the establishment of the Ministry of State for Population and Environment (MNKLH – Menteri Negara Kependudukan dan Lingkungan Hidup) in 1978. As a Ministry of State, or coordinating ministry, KLH’s primary roles were to develop policy and to mediate in disputes between sectoral agencies, such as between Transmigration and Forestry. The new ministry also worked to build awareness of environmental issues both within the government and among the public. In 1982, a basic Environmental Management Act (No. 4) set out provisions for an environmental regulatory framework. A legislative base for environmental impact assessment (EIA) was established under the Government Regulation for Environmental Impact Assessment in 1986.1

Indonesian EIA is widely known by its acronym, AMDAL - Analisis Mengenai Dampak Lingkungan Hidup (literally, “Analysis of Impacts on the Living Environment”). Throughout this report, “AMDAL” refers to the system and procedures of Indonesian EIA.

The Environmental Impact Management Agency (BAPEDAL - Badan Pengendalian Dampak Lingkungan Hidup) was established in 1990 to implement environmental regulations and policy, including EIAs. Rather than conduct or approve EIAs itself, BAPEDAL developed guidelines and protocols for design, implementation, review, and monitoring of assessments and mitigation measures. In 2002, BAPEDAL was terminated as a distinct agency; it was merged into the Ministry of Environment (Kementrian Lingkungan Hidup, LH). The Ministry has now taken on national-level functions for environmental enforcement, including oversight of the AMDAL process. As discussed below, Regional BAPEDALA (BAPEDAL-Daerah) offices, initially under the Ministry of Home Affairs, and now directly as offices of local governments, have recently been given the principal role in AMDAL review and environmental management.

Within just the past three years, with the passage in 1999 of Law Number 22 regarding Regional Governance (Autonomy), Indonesia’s entire system of government has undergone a shift from centralized to decentralized authority. The institutions involved in AMDAL evaluation are at the forefront of these changes. This chapter summarizes how the AMDAL system works, focusing on its current status and application in the context of the new regional autonomy laws.

1 Government Regulation No 29 of 1986 Regarding Environmental Impact Assessment, superceded by Government Regulation No 51 of 1993, which in turn has been superceded by Government Regulation No 27 of 1999.
1.1 The AMDAL Process

Like other national EIA systems worldwide, AMDAL requirements apply to most government and private sector projects. Carrying out an AMDAL study is the responsibility of the project developer or proponent, as are the mitigation and monitoring of the project's impacts. The types of activities subject to AMDAL are specified most recently in Ministry of Environment Decree Number 17 of 2001, *Types of Business and/or Activity Plans that are Required to be Completed with the Environmental Impact Assessment*. The list identifies the types of projects that are likely to have negative impacts that are significant, and that therefore need to undergo environmental assessment. For example, construction of a power transmission line with a carrying capacity of 150 kV or higher requires a full assessment.

A full AMDAL assessment involves a four-part series of studies and reports:

- Kerangka Acuan ANDAL (TOR for Environmental Impact Statement)
- ANDAL (*Analisis Dampak Lingkungan* – Environmental Impact Statement);
- RKL (*Rencana Pengelolaan Lingkungan* – Environmental Management Plan), and

The ANDAL provides baseline environmental information, and assessment of the likely impacts. The RKL explains the plans and procedures to be followed during the project to prevent or mitigate the anticipated impacts. The RPL identifies the reports and procedures for informing concerned agencies of progress and problems in implementing the RKL. In order for the project to proceed, these reports must be approved by the relevant AMDAL Commission.

**Figure 1A. Initial Steps in the AMDAL Process**

![Diagram showing the initial steps in the AMDAL process](image)
From the perspective of a project developer, the AMDAL process involves up to seven steps:

1) **Project Identification** -- by the project developer

2) **Screening** -- there are three possible categories. First, those projects for which an AMDAL is required, and the developer must refer to Ministerial Decree LH No.17/2001, which provides a list of project types with significant impacts. Second, for those projects not listed in that Decree as having significant impacts, but which still have minor impacts, a UKL/UPL is required, as is governed by Government Regulation 27/1999. Finally, for those projects with negligible impact, no AMDAL or UKL/UPL is required. However, PLN has developed a Standard Operating Procedure on Environmental Information for such projects.

3) **Scoping, with Public Consultation** -- Prior to the AMDAL study, Public Consultation is required to determine the TOR for ANDAL. Scoping is the process of identifying the range of likely impacts and issues that need to be assessed; a key part of this process is a public consultation, in which experts and others, including representatives of the communities in the project area, are invited; the project developer will provide details on the proposed project, and encourage discussion; the results of the meeting should be recorded, and taken into consideration in drafting the Terms of Reference (Kerangka Acuan – KA) of the ANDAL study.

4) **Approval of the KA-ANDAL** -- the TOR for the proposed ANDAL studies is submitted to the AMDAL Commission for approval.

5) **Assessment, and preparation of the mitigation and monitoring plans** -- based on the approved TOR, the project developer will prepare the study, usually by contracting for the services of qualified experts; during the assessment, people in the affected communities would be interviewed, and their interests and concerns taken into consideration.

**Figure 1B. Scoping, TOR, and ANDAL Studies**
6) approval of the assessment, management, and monitoring plans – the completed assessment, management and monitoring plans are submitted to the AMDAL Commission for review; the project developer may be requested to provide additional information or address any perceived deficiencies; the ANDAL/RKL/RPL are then approved, and signed by the head of BAPEDALDA or the relevant head of local government administration.

7) implementation, monitoring, and reporting -- costs of mitigation measures are generally borne by the project developer; monitoring of the project during construction and operations phases, as set out in the RPL, is a shared responsibility; if it is a national project, a supervisory team may be established under the responsible minister; if a provincial project, by the provincial governor; costs of supervision are borne by the institutions comprising this team.

Development activities that are unlikely to have significant or widespread environmental impacts\(^2\) are subject to a less rigorous and somewhat vaguely defined set of AMDAL studies\(^3\):

- **UKL** *(Upaya Pengelolaan Lingkungan -- Environmental Management Procedures)*, and
- **UPL** *(Upaya Pemantauan Lingkungan -- Environmental Monitoring Procedures)*.

These procedures are not subject to evaluation by an AMDAL commission. The “less significant” environmental aspects of these projects are to be covered within the Standard Operating Procedures (SOPs) of the implementing agency.\(^4\)

**Figure 1C. Review, Implementation and Monitoring of AMDAL Studies**

\(^2\) *Kepmen 481/PU/1996* defines those activities requiring UKL/UPL in the public works sector, for example, and there are similar decrees in other sectors.

\(^3\) As set out in *KEP-12/MENLH/3/1994*.

\(^4\) Ibid
1.2 Regional Autonomy

The Law of the Republic of Indonesia Number 22 of 1999 regarding Regional Governance (Autonomy) transferred most governmental functions from the central government to local governments—provinces (propinsi), districts (kabupaten), and cities (kota). Key provisions include:

- **Article 7 (1):** Regional Authority covers all fields of government, except foreign affairs, defense and security, judiciary, monetary and fiscal matters, religion, etc.;
- **Article 9 (2):** Provincial Authority as an Autonomous Region (Daerah Otonom) covers fields of governance that involve or cut across Districts (Kabupatens) and Cities (Kota);
- **Article 10 (1):** The Regions (Daerah) have authority to manage their own natural resources and are responsible for environmental preservation in accordance with national laws and regulations.
- **Article 11 (2):** Fields of governance that must be carried out by the District and the City include public works, health, education and culture, agriculture, communications, industry and trade, capital investment, environment, agricultural affairs, cooperatives, and manpower affairs.

The authorities of Provincial Governments in environmental fields were given a little more specifically in Article 3 of Government Regulation 25 of 2000:

- management of the environment across districts (kabupaten) and cities;
- regulating the utilization of marine resources between 4 miles and 12 miles from shore;
- control of the security and conservation of water resources across districts and cities;
- evaluation of AMDAL studies for activities that have a potential negative impact on the public whose location covers more than one district or city;
- supervision of environmental conservation across districts and cities; and
- determination of environmental standards based on national environmental standards.

Although authority for the environment has been largely decentralized to the regional governments, questions remain as to the relative authority for environmental management among the various local government administrations, i.e. what are the distinctive roles of provinces, districts, and cities?

Government Regulation Number 25 of 2000 also defines several specific roles for central government:

- determination of guidelines for managing natural resources and conserving the environment;
- control of the utilization of marine resources beyond twelve miles;
- evaluation of AMDAL for activities that have potential negative impacts related to defense and security, that are located in more than one province, in regions with disagreement with other countries, in marine regions of more than 12 miles, or in a border area with another country.
- determination of environmental standards and the determination of guidelines on environmental pollution;
- determination of guidelines for conservation of natural resources.

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5 Article 2 (item 18)
1.3 Decentralization of AMDAL Review and Approval

Law Number 22 of 1999 gave wide authority and responsibility to the Regions; they now must function on their own initiative to meet the interests of the local public and fulfill the potential of their region. Prior to Law Number 22, environmental management at the local level was defined under instructions of the Minister of Home Affairs. A Central Evaluator Committee, under the national BAPEDAL, reviewed and approved AMDAL assessments.

In 1996, regional environmental management agencies began to be established at the provincial and district levels. These are known as BAPEDALDA (BAPEDAL-Daerah). The BAPEDALDA were not directly linked to the national BAPEDAL agency, but rather to the Ministry of Home Affairs. Under Law Number 22, however, the governments of provinces, districts, and cities have their own authority to establish local environmental agencies. Currently, there are some 168 BAPEDALDA, established at the various levels of regional and local government.

The role of central government -- the Ministry of Environment -- is now only to give technical supervision, facilitate and promote, and set national standards related to environmental affairs. For AMDAL, the only projects subject to review at the national level are those involving defense and security, cut across more than one province, are in areas of dispute or borders with other countries, or that concern marine regions more than 12 miles from shore.

For full-fledged AMDAL studies – ANDAL-RPL-RKL – evaluation and approval is by an Evaluator Committee or AMDAL Commission. Their work is guided under Guidelines for AMDAL Document Evaluation, BAPEDAL Decree Number 2 of 2000. The AMDAL Commission draws upon the expertise of representative government agencies, public sector organizations, and the private sector. It appears that each BAPEDALDA has its own AMDAL Commission, to review ANDAL/RKL/RPL studies under their jurisdiction.
### Table 1A. Regulations on Environmental Management and Related Issues for Electrical Power Development

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Chapter 2  WORLD BANK ENVIRONMENTAL SAFEGUARDS

2.1 Safeguards and Environmental Assessment

World Bank programs are guided by a set of Operational Policies. Over the years, a number of these policies have been developed to assure that potentially adverse environmental and social consequences are identified, minimized, and mitigated. These are known as the "Safeguard Policies." The Bank Safeguards have been applied, collectively, since 1999 to all projects and must be addressed, wherever relevant, during the project preparation and approval process.

Table 1A. World Bank Safeguards – Operational Policies and Bank Procedures

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</table>

OP = Operational Policy; BP = Bank Procedure

During initial screening of the JBPSRS Project, Bank staff determined that the range of activities proposed did not involve any of the topic-specific Safeguards, with the exception of Involuntary Resettlement. None of the planned subproject activities will have any impact on natural habitats, forests or protected or sensitive areas, indigenous peoples, or cultural property. While there is no resettlement associated with the JBPSRS Project, the Bank’s operational polices and procedures relating to Involuntary Resettlement also cover compensation associated with land acquisition. Given that some land acquisition may be required for subprojects to be prepared during the course of project implementation, PLN has allowed for this possibility by preparing a stand alone Land
Acquisition and Resettlement Policy Framework document for the JBPSRS Project, in line with the Bank's OP/BP 4.12.6 (PLN's policies, guidelines and procedures for land acquisition are also described in Chapter 6 and Annex E of this EMP).

The two generic Safeguards, for Environmental Assessment and for Disclosure of Operational Information, apply to all Bank projects. Only these two policies and practices will be discussed here. Guidelines under the Environmental Assessment Safeguard provide the framework for this report.

Since 1991, Environmental Assessment (EA) has been a required component in design of all projects proposed for Bank financing. The Bank uses EA to ensure that projects will be environmentally and socially sound and sustainable; to inform decision makers of the nature of environmental and social risks associated with the project; to increase participation of stakeholders, including potentially affected persons and communities; and to increase transparency of project decisions.

The breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the project. Early on in the project design, Bank staff make a preliminary determination as to which of several assessment categories should be applied. The principal category designations are A and B.

**Category A Projects** are likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral EA) that includes an Environmental Management Plan (EMP).

**Category B Projects** are likely to have fewer and less extensive adverse environmental impacts on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, than are projects under Category A. These impacts are generally site specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope for EA of Category B projects varies from project to project, but it is generally narrower than that of Category A projects. Like Category A, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

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6 The definition of "land" in OP4.12 includes anything growing on or permanently affixed to land, such as buildings and crops.
2.2 Disclosure and Responsibilities

The findings and results of the EA are described in the Bank's Project Appraisal Document and Project Information Document. BP 17.50, the Disclosure of Operational Information Safeguard, provides for public access to project information, including the results and information contained in EA’s. For Category A projects, the borrower must make the EA available to the public “at some public place accessible to affected groups and local NGOs” as well as to the Bank’s Public Information Center. For Category B projects, the environmental analysis is summarized in an annex to the Project Identification Document and documented in the project’s Project Appraisal Document. Environmental Management Plans are also to be made available to the international public through the Public Information Center.

The borrower is responsible for carrying out the EA. For Category A projects, the borrower should retain independent EA experts not affiliated with the project to carry out the EA. During the EA, consultations should be held with project-affected groups and local NGOs. For Category A Projects, this consultation should occur at least twice, first as a scoping session to assure that the full range of issues of concern will be addressed, and then again to review the draft EA and Environmental Management Plan.

The World Bank is responsible for screening the project and determining the EA category, and advising the borrower about the Bank’s EA requirements and procedures. After the EA is completed, the Bank must also review it and assure that it provides adequate information and satisfactorily addresses any environmental and social concerns, before proceeding to final appraisal of the project.

2.3 Environmental Management Plans

An important part of an EA for the Bank is the Environmental Management Plan (EMP). A project's EMP consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. Management plans are essential elements of EA reports for Category A projects. For many Category B projects, the EA may result in a management plan only. To prepare a management plan, the borrower and its EA design team (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the EMP includes the following components.

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7 If the funding source for the Project is IDA (International Development Association) funds, any separate EA report for a Category B project is also subject to full public disclosure in the borrowing country as well as to the Bank’s Public Information Center.
MITIGATION

The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient.

MONITORING

Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP.

CAPACITY DEVELOPMENT AND TRAINING

To support timely and effective implementation of environmental mitigation and management components of the project, the EMP draws on the EA’s assessment of the existence, role, and capability of environmental units of the project developer, or for concerned agencies or ministries. If needed, the EMP recommends the establishment or expansion of such units, and training of staff. The EMP should indicate institutional arrangements – identifying who is responsible for carrying out the mitigatory and monitoring measures. To strengthen environmental management capability in the agencies responsible for implementation, EMPs usually include a combination of: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

IMPLEMENTATION SCHEDULE AND COST ESTIMATES

For all three aspects (mitigation, monitoring, and capacity development), the EMP should provide (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

INTEGRATION OF EMP WITH PROJECT

The borrower’s decision to proceed with a project, and the Bank’s decision to support it, are predicated in part on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project’s overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.
Chapter 3 PLN’S ENVIRONMENTAL MANAGEMENT POLICY AND PRACTICE

3.1 Brief History of PLN’S Environmental Organization

1985 – Establishment of the Engineering Center

Board Decree No.085/DIR/85 dated May 10, 1985, established the Engineering Center as PLN’s in-house consultant service. By early 1988, the Center was fully staffed and operational. To execute its tasks, the Center could work with external consultants, international or Indonesian, as deemed necessary. The Center grouped its professional engineers in four departments: civil, mechanical, electrical, and support engineering. The support engineering department also incorporated an environmental specialist group, which was responsible to take care of PLN’s obligation to meet national as well as other environmental regulations as required.

This environmental group supervised external consultants as necessary to prepare and finalize the environmental documents for PLN’s development projects. The head of the Center also served as Chairman of PLN’s environmental committee, then required by law, and as alternate member of the central environmental commission of the Ministry of Mines and Energy.

1995 - Creation of DIVLING

The Environment Division (Divisi Lingkungan – DIVLING) was established by Board Decree No.040.K/022/DIR/1995 dated June 26, 1995, as part of the Directorate of Operations. DIVLING soon had in place 36 staff; 14 professional and 16 administrative. Three sub-divisions took responsibility for EIA/AMDAL requirements: for thermal generation, hydro generation and transmission developments respectively. A fourth sub-division was responsible for developing, coordinating and supervising environmental management processes in all PLN units and also mitigating and monitoring environmental activities. The Manager of DIVLING was appointed as Chairman of the Environmental Committee.

From 1995 on, DIVLING took over direct environmental responsibilities from the Engineering Center, but continued to turn to the Engineering Center whenever needed for technical support. The Engineering Center continued to give engineering support to all of PLN as an in-house consultant group – and continues to do so today. In January 1997 an ISO-9001 Certificate was issued by KEMA8 to the Engineering Center as a recognition of its well-managed engineering services.

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8 PT. KEMA Registered Quality is a public interest testing and certification company, with headquarters in the Netherlands.
1997-1998 - Technical Assistance and Improved Procedures

In this period, PLN received environmental capacity-strengthening support under two World Bank loan projects. First was a general environmental capacity building program, focused on PLN’s Head Office. The second supported improved management of Cirata and Saguling Dams. Both projects provided training and expert advisors, and both sets of consultants provided recommendations for future environmental development within PLN. Budget figures are not available, but the two projects are estimated to have amounted to approximately US $2 million in loans drawn from the World Bank.

The first of these projects was under a World Bank Loan9 formulated in 1995 for Strengthening of PLN’s Environmental Management Capability (EMC). By the time that consultant services were procured in 1997, DIVLING was established, and able to provide a strong counterpart base for the consultants.

Approximately 50 man-months of expertise – 22 international and 28 local – were provided over the eighteen-month period from June 1997-December 1998. Lahmeyer International GmbH of Germany, in association with P.T. Jaya CM Manggala Pratama, provided the consulting services. Tasks defined in the terms of reference are shown in Table 3A. Each topic was addressed during a 2-4 week visit by international specialists, and results were summarized in a series of project reports. A number of guidelines and procedures were established for implementation by the Environment Division. For example, one of the programs addressed the issue of polychlorinated biphenyls (PCBs); a survey was conducted leading to the conclusion that PLN neither used nor had in storage any PCBs.

In their final report,10 the consultants offered a series of recommendations for future environmental programs and activities at PLN. Principal recommendations were:

- Environmental policy and reporting needs to be centralized, especially as PLN undergoes restructuring into semi-independent business units.
- DIVLING should be given a greater role in assisting operational units to:
  - minimize emissions, effluents, and water consumption;
  - promote supply side and demand side management; and
  - undertake CO₂ reduction measures.
- PLN should move to develop a certifiable Environmental Management System (ISO 14000).
- Environmental data needs to be organized into a company-wide computer-based environmental information system.
- DIVLING should be given formal responsibility and capability to conduct environmental monitoring, including audits of PLN operations – and of IPPs.
- PLN should introduce and practice audits of occupational health and safety practices.
- PLN should develop its use of modeling (e.g. atmospheric dispersion models) for environmental analyses.
- DIVLING should work with PLN management to prepare a regular PLN Environmental Report, and a comprehensive corporate Environmental Management Policy.

9 Loan No.3761-IND
10 World Bank Loan No 3761-IND; Contract No.011.PJ/070/1997/M; provided by Lahmeyer Interternational GmbH and PT Jaya CM Manggala Pratama
Table 3A Consulting Services for the Strengthening of PLN's Environmental Management Capabilities

1. Study on the influence of the power sector restructuring on PLN's environmental management.
2. Demonstration of the direct benefits of environmental protection work of the Environment Division.
3. PLN's contribution to CO2 emission in Indonesia and its comparison with other countries.
4. Preparation of Guidelines for occupational safety and health audits
5. Preparation of Guidelines for environmental audits
6. Preparation of Guidelines for a monitoring data transfer system; exchange of experience on atmospheric dispersion models.
7. a. Preparation of Guidelines for minimizing gas emissions and optimizing generation of thermal power plants.
   b. Preparation of Guidelines for minimizing effluents and reducing water consumption of thermal power plants.
   c. Outlines of the general structure of a loss reduction program for transmission and distribution of electric power.
   d. Outlines of the general structure of an energy conservation program for the utilization of electrical power.
8. Outlines of an environmental PLN report including investment in environmental protection.
9. Outlines of the general structure of a computer-based environmental information system.

The Cirata and Saguling Environmental Studies and Training Project was provided under the World Bank’s Cirata Hydro Phase II Loan. Electrowatt Engineering worked with Amythas Experts & Associates, PT to conduct studies and training focused on better understanding and management of the Citarum River Basin.

Several of the final recommendations of the Cirata and Saguling Environmental Studies and Training consultants echo those from the EMC project:

- Create an Environmental Data Management Unit within DIVLING, to:
  - coordinate environmental monitoring activities within all Hydropower Sectors
  - obtain monitoring protocols from subcontractors (laboratories, universities)
  - monitor performance by setting performance indicators; and
  - store data in a centralized databank.
- Establish a Watershed Management Authority (WMA) in which PLN, through DIVLING, will hold an appropriate role.

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12 PT PLN, with Electrowatt Engineering and Amythas, 1998, Cirata and Saguling Environmental Studies and Training FINAL REPORT.
Provide specific technical training for staff of the proposed Environmental Data Management Unit, mainly in the fields of:
  - water chemistry, lake dynamics and hydrobiology, and
  - database application and data management.

Provide general training for PLN environmental staff in all aspects of reservoir management (watershed management, water quality, environmental monitoring, etc.)

Disseminate scientific information in relation to reservoir water quality and related environmental issues by participating in scientific seminars, etc., to present and share their findings.

Support Environmental Education for the public by:
  - addressing those directly responsible for education (e.g. Ministries of Education, Health, Tourism, etc.) with PLN’s concerns and offering collaboration;
  - utilizing and disseminating existing information material for broader use in schools;
  - developing a PLN public awareness program, in the press media or on TV, linking advertisement of its services with information on environmental issues.

1999-2002 - Reorganization for Decentralization

Following the economic crisis of 1997, and the reinvigoration of Indonesian democracy, Law of the Republic of Indonesia Number 22 of 1999 Regarding Regional Governance (Autonomy) was passed. The national decentralization movement provided a climate conducive to the process of decentralization and deconcentration already underway within PLN.

In October 2001, the organization of PLN Head Office was restructured and the roles and responsibilities of PLN Head Office were redefined. One of the main changes in the restructuring was elimination of the Environment Division, since PLN Head Office would no longer deal with the preparation of EIA/AMDAL. This was in line with the policy of regional autonomy, where authority for AMDAL procedures and decisions was now primarily under the regional environmental agencies (BAPEDALDA). Under the new organization, implementation of PLN’s environmental management and monitoring plans is the responsibility of units at the field operational level.

In order to meet the World Bank’s requirements for the planned JBPSRS Project, the Corporate Planning Team was assigned to work with other parties within PLN to prepare this EA and EMP.

PLN’s current organization chart is presented in Figure 3B. Under the reorganization of October 2001, a Vice President of Quality Assurance and Environment was appointed. Like other vice presidents, he has responsibility for setting policy, not for operations. He is currently assisted by two professional staff. The functions and responsibilities of this and other key corporate positions and offices under the reorganization that are of direct relevance to environmental management are summarized in Tables 3C and 3D.
3.2 Looking Ahead: PLN's Continuing Environmental Commitment

In the year 2000, PLN adopted a new corporate Mission Statement that made environmental management a core commitment of the company:

"To conduct electricity business oriented towards customer satisfaction, employees, owners and in an environmentally friendly way. To produce electricity as a means to increase the quality of life of the people and to push economic growth."[emphasis added]

PLN is aware that "Best Practices" for environmental management in the power industry worldwide have changed markedly in recent decades. In the early 1970s, power companies, like other major industrial groups, began to formulate environmental management programs. At first, these were based on compliance with new laws regarding worker health and safety, and control of pollution. Gradually, pro-active initiatives have been added, such as waste minimization, corporate reporting, and environmental management systems. Worldwide also, corporate decision-making has been decentralized, brought closer to the customer, and to day-to-day field operations. At the same time, new communications and information technology have enabled smaller central management teams to improve coordination and learning across the company. This rapid evolution from "EHS" to "CHESS" type environmental management, is depicted in Table 3E.

There is good evidence that those companies that are leaders in environmental management are consistently among the best managed overall. For example, Innovest, an internationally recognized independent investment research firm, recently analyzed 28 major US power companies. They were compared across more than 60 aspects of environmental risk exposure, management quality, and business development. Innovest concluded that, "As a strong proxy for management quality, environmental performance consistently correlates well with stock price performance. Companies with above average ratings taken as a group achieved an average total shareholder return (stock price appreciation plus dividends) 30 percentage points greater than the average return of lower rated companies over the past three years."13

With the creation of the environmental group in the new Engineering Center in the mid-1980s and subsequent efforts leading to the new Mission Statement in 2000, PLN has begun to establish a core of EHS competence. Today, a number of CHESS-type activities are underway: initiatives in geothermal and renewable energy, energy conservation, community consultation, and – beginning in January 2002 – carbon trading. There are increasing opportunities – and needs – for PLN to strengthen the coordination of these efforts and strengthen its competence in these new areas, both at the central and local levels.

As PLN moves into an era of restructuring while coping with serious market challenges, it also wishes to benefit from international experience and Best Practices and in environmental management. The institutional strengthening component proposed in Chapter 7 would provide a significant boost to PLN's environmental and overall quality management efforts.

Figure 3B  Organization Chart for PLN Head Office

Table 3C. Job Description for Key Positions Relevant to Environmental Management – Part 1. Vice Presidents

<table>
<thead>
<tr>
<th>Position</th>
<th>Job Description</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP of Corporate Restructuring [Article 4]</td>
<td>1. To develop corporate restructuring policy.</td>
<td>The corporate MISSION of PLN for the year 2000 was “To conduct electricity business oriented towards customer satisfaction, employees, owners and in an environmentally friendly way. To produce electricity as a means to increase the quality of life of the people and to push economic growth”. It is then imperative that the VP of Corporate Restructuring maintain strong environmental consideration in the restructuring of the company and the development of the organization</td>
</tr>
<tr>
<td></td>
<td>2. To coordinate the implementation of corporate restructuring.</td>
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<td></td>
<td>3. To facilitate restructuring including through organization development.</td>
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<tr>
<td></td>
<td>4. To evaluate the restructuring progress.</td>
<td></td>
</tr>
<tr>
<td>VP of Quality Assurance (QA) and Living Environment [Article 6]</td>
<td>1. To develop corporate policy on quality and standards</td>
<td>The current task of the VP of QA &amp; Living Environment is to develop Corporate Policies and Programs, i.e. upstream of the management chain, without being directly involved in their implementation.</td>
</tr>
<tr>
<td></td>
<td>2. To develop corporate policy on environmental management</td>
<td></td>
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<tr>
<td></td>
<td>3. To develop corporate program on quality assurance and improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. To develop corporate program on environmental conservation</td>
<td></td>
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<tr>
<td></td>
<td>5. To develop policy on health management and safety</td>
<td></td>
</tr>
<tr>
<td>VP Corporate Performance [Article 8]</td>
<td>1. To develop policy on the control of corporate performance through the Business Units and Subsidiaries.</td>
<td>The VP’s task in this case (unlike Article 6) also includes coordinative executive responsibilities, not only (upstream) policy development. The inclusion of environmental aspect may have to be considered to get an integrated report on PLN’s overall corporate performance, thereby addressing the high environmental performance promised in PLN’s Corporate Mission.</td>
</tr>
<tr>
<td></td>
<td>2. To coordinate evaluation of Financial Statements of the Corporation, Business Units and Subsidiaries.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. To facilitate implementation of corporate control system.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. To coordinate management report on the implementation of Business Plan and Budget.</td>
<td></td>
</tr>
<tr>
<td>VP Communication and Community Development [Article 11]</td>
<td>1. To develop corporate policy and strategy on communication.</td>
<td>Like Article 8, the VP’s task also includes coordinative executive responsibilities. It is generally accepted, nowadays, that social accountability shall be part of the environmental requirement.</td>
</tr>
<tr>
<td></td>
<td>2. To develop corporate policy and strategy on community development.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. To coordinate control and evaluation of corporate communication.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. To coordinate control and evaluation of community development</td>
<td></td>
</tr>
</tbody>
</table>

Note: It seems that “Department” (translation for “Bidang”) is used for a “structural” work group as compared to “Team” for a more “functional” work group.
### Table 3D. Job Description for Key Positions Relevant to Environmental Management -- Part 2. Directorates

<table>
<thead>
<tr>
<th>Position</th>
<th>Job Description</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directorate of Planning</strong> [Article 16]</td>
<td></td>
<td>Referring to the Board's Decree No.201.K/010/DIR/2001, there is no clear environmental orientation in the Team's job description, nor there is any environmental expert in the Team. However, Indonesia's environmental regulatory clearance for all new developments necessitates the Team's close involvement in the EMP process. In the project development stage, environmental aspects of projects are scrutinized in accord with AMDAL requirements.</td>
</tr>
<tr>
<td>1. Secretary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. System Planning Team:</td>
<td>- To develop electrical power system plan and energy model. - To develop electrical power supply system. - To develop load forecasting model. - To study utilization of natural resources. - To develop power system investment plan.</td>
<td></td>
</tr>
<tr>
<td>3. Corporate Planning Team:</td>
<td>- To prepare the business plan and financial projection. - To manage and supervise consulting services. - To administer overseas cooperation programs including funding by loans. - To coordinate cooperation programs with electrical power utilities and other institutions.</td>
<td></td>
</tr>
<tr>
<td><strong>Directorate of Operations</strong> [Article 17]</td>
<td></td>
<td>Referring to the Board's Decree No. 202.K/010/DIR/2001 on the formation of the Corporate Planning Team, the condition is the same as the System Planning Team. However, rigid environmental requirements of overseas lending institutions necessitate the Team's involvement in the EMP process to manage and supervise the necessary consultants.</td>
</tr>
<tr>
<td>1. Secretary.</td>
<td></td>
<td>The Board's Decree No.192.K/010/DIR/2001 forms the Team. It is responsible to manage the implementation of the RKL/RPL, and hence the environmental reports. However only three of its staff have an environmental background (and two of these are currently assigned to the VP for Environment).</td>
</tr>
<tr>
<td>2. Operation Coordination Team.</td>
<td>- To manage and supervise utilization of primary energy resources. - To manage and supervise system reliability. - To manage the implementation of environmental management by construction and operating units. - To manage maintenance of the operating assets.</td>
<td>The Board's Decree No.193.K/010/DIR/2001 forms the Team. It has no personnel with environmental background to supervise the implementation of the EMP during construction.</td>
</tr>
<tr>
<td>3. Construction Coordination Team.</td>
<td>- To execute construction management and project performance. - To manage works under construction and to control and evaluate contract claims.</td>
<td></td>
</tr>
<tr>
<td><strong>Directorate of Human Resources and Organization</strong> [Article 20]</td>
<td></td>
<td>The Human Resources &amp; Organization Department (through the Safety and Occupational Health), the Legal and Regulatory Team, and the Public Relation Team should be associated with the environmental procedures.</td>
</tr>
</tbody>
</table>
Table 3E  Evolution of Environmental Management Topics for Power Companies Worldwide

<table>
<thead>
<tr>
<th>First Generation Environmental Management</th>
<th>Second Generation Environmental Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&quot;E H S&quot;</strong></td>
<td><strong>&quot;C H E S S&quot;</strong></td>
</tr>
<tr>
<td>Environment</td>
<td>Community</td>
</tr>
<tr>
<td>- environmental assessment</td>
<td>- consultation</td>
</tr>
<tr>
<td>- compliance with air, water, waste laws</td>
<td>- compensation</td>
</tr>
<tr>
<td>Health &amp; Safety</td>
<td>- corporate citizenship and involvement</td>
</tr>
<tr>
<td>- occupational health and safety</td>
<td>- communications and public reports</td>
</tr>
<tr>
<td>- community right-to-know</td>
<td>- disclosure</td>
</tr>
<tr>
<td>- emergency preparedness &amp; response</td>
<td>- Internet presence</td>
</tr>
<tr>
<td>Environment</td>
<td>Health &amp; Safety</td>
</tr>
<tr>
<td>- environmental assessment</td>
<td>- occupational health and safety</td>
</tr>
<tr>
<td>- compliance with air, water, waste laws</td>
<td>- community right-to-know</td>
</tr>
<tr>
<td>- carbon management &amp; trade</td>
<td>- emergency preparedness &amp; response</td>
</tr>
<tr>
<td>- energy conservation – demand side and supply side management</td>
<td></td>
</tr>
<tr>
<td>- waste minimization, pollution prevention</td>
<td></td>
</tr>
<tr>
<td>- “green” energy, cleaner fuels, renewables</td>
<td></td>
</tr>
<tr>
<td>Systems</td>
<td>Sustainability</td>
</tr>
<tr>
<td>- environmental management systems (EMS), leading to ISO 14000 certification</td>
<td></td>
</tr>
<tr>
<td>- computerization of data, reports, and communications</td>
<td></td>
</tr>
<tr>
<td>Sustainability</td>
<td>Core Responsibilities of Central Management:</td>
</tr>
<tr>
<td>- corporate commitment and follow-through</td>
<td></td>
</tr>
<tr>
<td>- emphasis on quality</td>
<td></td>
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<tr>
<td>- adaptability and responsiveness to changing markets</td>
<td></td>
</tr>
<tr>
<td>- diversification of generation sources</td>
<td></td>
</tr>
<tr>
<td>- R&amp;D, introduction of new technology</td>
<td></td>
</tr>
<tr>
<td>- worker empowerment &amp; responsibility</td>
<td></td>
</tr>
</tbody>
</table>

Core Responsibilities of Central Management:
- policy and standard setting,
- coordination,
- quality control,
- monitoring,
- knowledge management,
- training,
- and reporting:
PART II

PROJECT DESCRIPTION
AND ASSESSMENT OF
LIKELY IMPACTS
Chapter 4
PROPOSED PROJECT ACTIVITIES

The JBPSRS Project will support transmission works identified under PLN's Java-Bali Medium Term Investment Program. This chapter describes the power network components for transmission and subtransmission systems proposed for financing under the project.

Figure 2. 500 kV Transmission Network on Java

Relieving Constraints in the Bulk Transmission System

Apart from the need for additional generation capacity, the most critical issue facing PLN with respect to its medium term investment program remains the delays in the completion of the bulk 500kV transmission system, since these works should have already been commissioned. In particular, PLN will continue to be unable to fully dispatch existing generation capacity in an adequately secure manner—or Tanjung Jati B once it is commissioned—until all elements of the southern section of the 500kV transmission loop are completed (currently scheduled for the end of 2004).

The southern section of the 500kV loop runs from the Paiton complex in East Java—comprising 800MW and 2,450MW of PLN and IPP-owned coal-fired capacity respectively—through a proposed new substation at Kediri, to the already-commissioned Klaten substation. There it will connect with the existing 500kV line coming from Ungaran substation on the northern section of
the loop. From Klaten, the southern section continues west to Depok III—a proposed new substation south of Jakarta—via a proposed substation at Tasikmalaya. The transmission segments from Kediri to Klaten, and from Paiton to Kediri, are completed. Both were financed by the Bank under the Second Power Transmission and Distribution Project (Loan 3978-IND). PLN has recently undertaken some prudent steps to allow additional load to be dispatched at the Paiton generating complex until the southern section of the 500kV loop is completed. Construction of temporary bypasses at the Paiton and Kediri 500/150kV substations, completed in April 2002, has allowed one of the two circuits from Paiton to Klaten to be energized.

In addition, PLN plans to provide some relief of the remaining constraints in the bulk transmission system in two stages. The first stage involves expediting the energization of the second circuit from Paiton-Kediri-Klaten, by relocating the two 500MVA transformers at the completed Surabaya-Selatan 500/150kV substation to Kediri and Klaten substations respectively, for commissioning by late 2003. Upon commissioning, the load at Kediri substation is expected to immediately reach 300-350MW, meaning that a second transformer will be required within a short period. These actions will allow an estimated 200MW more power to be dispatched from the constrained Paiton/Gresik/Grati complexes. However, the entire constraint cannot be relieved due to stability limits in the bulk transmission system between Ungaran and Mandirancan. Hence, the second stage of relieving the transmission constraints involves installing a second 500MVA transformer at the Mandirancan 500/150kV substation near Cirebon, and making associated network reconfigurations. PLN and the Bank have agreed that the Mandirancan substation expansion will be included in the JBPSRS Project.

|MANDIRANCAN S/S EXTENSION| To relieve constraints on dispatching Paiton/Gresik/Grati complexes, and to improve power supply to Cirebon area and southern part of Central Java, since both areas are supplied through one IBT at Mandirancan which is already loaded at 80%.

1x500/150kV Transformer, 500MVA  
1x500kV Diameter 3 CB (Transf. bay)  
1x150kV Transformer Bay  
2x500kV Diameter 2 CB (T/L bay)

**Improving Availability and Security of Generation Capacity**

PLN and IPP geothermal units operating at Darajat, Kamojang and Wayang Windu in West Java are currently connected into the Java-Bali grid via a 150kV subtransmission line running between Bandung Selatan and Ciamis substations. To provide a level of security commensurate with the existing generation capacity evacuated through this part of the West Java subtransmission network, PLN urgently needs to uprate this line, and to add a second circuit connecting the Wayang Windu plant into the subtransmission grid. (The proposed design is sufficient to allow for later expansion of the existing plants, as is provided under the PPAs for the IPP plants). PLN and the Bank have agreed that these works will be included in the Project.

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1 Note: T/L: Transmission Line  
IBT: Interbus Transformer  
OHL: Overhead Line  
S/S: Substation  
CB: Circuit Breaker  
cct : Circuit
**Strengthening the Local Transmission System**

While the most critical issues facing PLN in operating the Java-Bali system over the medium term are the need for adding/securing generation capacity and completing the bulk transmission system, resolving these mismatches in the overall supply/demand balance will not relieve all the short or medium term bottlenecks experienced in localized parts of the power delivery system. Under even the Limited Demand Forecast, capital expenditures required to debottleneck local interconnections between bulk transmission and subtransmission levels—and to replenish essential stocks of associated equipment—include the need for: (i) a second 500MVA transformer and associated works at and around the Mandirancan 500/150kV substation, in order to provide a more secure supply to city of Cirebon (which is also needed for relieving bulk transmission constraints); (ii) two new 500MVA transformers at the 500/150kV Surabaya Selatan substation, to replace those to be relocated to Kediri and Klaten, and these need to be installed by the time the new Grati-Surabaya Selatan 500kV transmission line is commissioned; (iii) three new 500kV circuit breakers for Bandung Selatan, Ungaran and Gandul substations; (iv) a second 500MVA transformer at Kediri; and (v) two additional single phase 500/150kV transformers associated with the above investments. PLN and the Bank have agreed that these works will be included in the new Project.

**SURABAYA SELATAN S/S**
- 2x500/150kV Transformer, 500MVA
  - To improve power supply to the city of Surabaya

**NEW KEDIRI S/S EXTENSION**
- 1x500/150kV Transformer, 500MVA
- 1x500kV Diameter 2 CB (Transf. bay)
- 1x150kV Transformer Bay
  - To improve power supply to Kediri area and southern part of East Java

**OTHER TRANSMISSION COMPONENTS**
- 500kV CBS
  - 3SF6 500kV CBS
- Transformer Bank 500/150kV
  - 2x500/150kV Single Phase Transformer
  - 3 CBs to replace air blast type CB in Bandung Selatan, Ungaran and Gandul S/S
**Strengthening the Local Subtransmission System**

There are numerous requirements for small-scale 150 kV, 150/70 kV and 150/20 kV subtransmission investments, due to existing and future localized overloading and voltage problems. A large number of 150/70 kV and 150/20 kV transformers at substations throughout Java and Bali require replacement with larger units. Additionally, new transformers need to be added to enhance the capacities of many substations and enable the increasing load demands to be accommodated. Some of these substations do not have an adequate level of security to be able to maintain supply during an outage event. Other substations have dual transformers, but these could overload if one of the transformers were not available. Associated with this need to replace transformers and extend substations is the need to replace numerous 150 kV circuit breakers, also due to overloading. This circuit breaker replacement program is considered to be high priority because it has insufficient fault rating, placing staff and the public at risk of injury, and increasing the risk of lost supply to consumers.

Consequently, the Bank has agreed to include an envelope of funds in the Project to contribute to PLN's transformer and circuit breaker replacement program at existing substations throughout Java-Bali, and also the substation extension program. PLN will seek the Bank’s no objection prior to the implementation of each subproject, and provide evidence that the implementation is consistent with the Project’s objectives and this EMP, and will be completed within the Project implementation period.

In addition, to provide greater security of supply to the city of Surabaya, the Project will provide financing toward a new 5km 150kV transmission line from Perak to Ujung. This will complement the works associated with Surabaya Selatan 500/150kV substation. Finally, the Project will include the installation of 100MVA 150/70kV interbus transformers at each of Cibinong and Manisrejo/Banaran substations, or similar subprojects.

<table>
<thead>
<tr>
<th><strong>SURABAYA SUPPLY</strong></th>
<th><strong>To improve security of supply to Surabaya city</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perak – Ujung T/L</td>
<td></td>
</tr>
<tr>
<td>150kV 2cct ACSR 2xZebra OHL, 5km</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER SUBTRANSMISSION COMPONENTS</strong></td>
<td><strong>For Cibinong and Manisrejo/Banaran substations</strong></td>
</tr>
<tr>
<td><strong>Interbus Transformers</strong></td>
<td><strong>150kV S/S, due to high loading</strong></td>
</tr>
<tr>
<td>2x500/150kV Single Phase Transformer</td>
<td>28 existing CBs have a breaking capacity below their short circuit level</td>
</tr>
<tr>
<td>150kV CBs Upgrading</td>
<td></td>
</tr>
<tr>
<td>28x150kV CBS</td>
<td></td>
</tr>
<tr>
<td><strong>Gandul S/S Extension</strong></td>
<td><strong>Improve security at Gandul S/S (existing two transformers already at 90% loading)</strong></td>
</tr>
<tr>
<td>1x150/20kV Transformer, 60MVA</td>
<td></td>
</tr>
<tr>
<td>20kV Switchgear &amp; 150kV Transf. Bay</td>
<td></td>
</tr>
<tr>
<td><strong>Transformer Replacement &amp; Substation Expansion</strong></td>
<td><strong>Reduce overloading and improve voltages</strong></td>
</tr>
<tr>
<td>Multiple Subprojects throughout Java and Bali to be determined during project implementation, involving the addition or replacement of 30MVA or 60MVA 150/20kV transformers, with associated switchgear, civil construction and transformer bay(s) where required</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5 LIKELY IMPACTS OF PROJECT ACTIVITIES

5.1 General Impacts of Power Transmission Projects

Activities proposed under the project will provide positive social and environmental benefits. Each of the planned subprojects will contribute to improving the operating efficiency of the Java-Bali power grid system. In particular, they will enable PLN to utilize more fully several existing power plants, including the geothermal units at Drajat, Kamojang, and Wayang Windu. Increased reliability and availability of power through PLN’s transmission system will also reduce the need for manufacturing companies and other enterprises on Java and Bali to produce power on their own. These small captive generators usually run on diesel, and are generally less efficient and emit more pollution per unit of power produced than do PLN’s power plants. All of the social benefits derived from reliable electric power supplies will also be enhanced.

While a quantitative assessment of these benefits – which are environmental, social, and economic – is beyond the scope of this EMP, they will be significant. PLN needs to develop the capacity to quantify these benefits, and a component for doing so is included in the EMP’s institutional strengthening plan presented in Chapter 7.

For all of the planned subprojects of the JBPSRS Project, adverse environmental and social impacts are likely to range from minor to negligible. The proposed activities consist of replacing or uprating the conductors on existing transmission lines, and improving transformers and interconnectors within the existing transmission system. No new transmission lines are included, so there will be little if any need for acquisition of land, and no existing dwellings, enterprises, or buildings are expected to be adversely affected.

A list of environmental impacts generally associated with power transmission projects is presented in Table 5A. Most of these apply primarily to construction of new power lines. All of these concerns are familiar to PLN transmission managers and work crews, but should be kept in mind for the JBPSRS Project activities.
Table 5A. Likely Impacts of Power Transmission Projects

<table>
<thead>
<tr>
<th>Access Roads</th>
<th>The construction of access roads can impact the environment through vegetation clearance and compaction of land. Access roads can open a way for natural resources that are presently difficult to reach.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-of-Way (ROW)</td>
<td>Possible interference with or fragmenting of land uses along the ROW. Opening of remote lands to human activities such as settlement, agriculture, hunting, recreation, etc. Construction of the ROW can result in the loss and fragmentation of habitat and vegetation. These effects can be significant if natural areas, such as wetlands or wildlands are affected, or if the newly-accessible lands are home to indigenous peoples.</td>
</tr>
<tr>
<td>Increased Traffic</td>
<td>Disruption of traffic, and safety of local inhabitants and workers during the construction of transmission lines.</td>
</tr>
<tr>
<td>Construction of Campsites</td>
<td>Construction camps can impact the environment through vegetation clearance, compaction of land, and improper management of solid and liquid wastes.</td>
</tr>
<tr>
<td>Adjacent Communities</td>
<td>Communities affected by the construction of transmission lines expect employment, improved standard of living and business opportunities.</td>
</tr>
<tr>
<td>Construction of Transmission Line Towers, Tower Pads, and Substations</td>
<td>Clearing of vegetation, site compaction and land acquisition can change land use patterns.</td>
</tr>
<tr>
<td>Air and Dust Emissions</td>
<td>During the construction of access roads, substations and clearing of vegetation along the ROW.</td>
</tr>
<tr>
<td>Noise</td>
<td>Noise resulting from access road and transmission line construction may disturb the neighboring communities and local fauna.</td>
</tr>
<tr>
<td>Influx of People</td>
<td>Temporary influx of skilled labor during the construction of transmission lines and its interaction with locals.</td>
</tr>
<tr>
<td>Electromagnetic Fields (EMF)</td>
<td>The strength of both electric and magnetic fields decrease with distance from transmission lines. The scientific community has not reached a consensus on specific biological responses to EMF, but the evidence suggests that health hazards may exist.</td>
</tr>
<tr>
<td>Safety</td>
<td>Placement of low-slung lines or lines near human activity (e.g., highways, buildings) increases the risk for electrocutions. Also, towers and transmission lines can disrupt airplane flight paths in and near airports and endanger low-flying aircraft, such as those used in agricultural management activities.</td>
</tr>
</tbody>
</table>
5.2 PCBs and EMFs

Two universal concerns about transmission lines projects are (1) disposal of polychlorinated biphenyls (PCB's), and (2) possible health impacts of electromagnetic fields (EMF) associated with power lines.

PCBs used to be widely used as insulators in electrical equipment, including transformers; capacitors; switches; voltage regulators; circuit breakers; reclosers; etc. They are of concern because they are powerful toxins, even at low concentrations, and they persist and bioaccumulate in the environment. In 1997 the World Bank-funded EMC team worked with the Environment Division to assess PLN’s use and possible stocks of PCBs. They found that PCBs had been phased out of use in Indonesia in the late 1960s, and that there was no evidence that any current PLN equipment or supplies contained any.

EMFs are a more difficult and currently inconclusive issue. Medical concerns about human exposure to EMFs from power lines have gradually increased over the past several decades, and recently there are additional concerns about new sources such as cell phones. But there is as yet no scientific consensus, or even widely accepted standard for exposure. In principle, PLN like other Indonesian agencies follows standards set by the World Health Organization (WHO). But WHO has not yet set a firm standard. WHO is currently conducting an International EMF Project, working with the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a non-governmental organization that has formulated guidelines establishing limits for occupational and residential EMF exposure based on peer-reviewed scientific literature.

Under the JBPSRS Project, changes in EMF exposure will occur along the uprated lines. But none of the lines targeted for work under the Project would exceed 150 kV. The issue goes well beyond the scope of this assessment to address. The Ministry of Environment has recently convened an interagency panel to review Indonesian standards and guidelines for EMF exposure, and PLN is represented on the panel. If current procedures are revised, PLN will take measures to assure that all of its transmission line operations remain within compliance.

5.3 Subprojects of Particular Interest

There is one subproject planned that merits specific description. In several cases, the uprating of existing transmission lines will require a full environmental review under Indonesian environmental impact assessment (AMDAL) regulations, though not under Bank guidelines, and in one of these cases, new transmission towers will be required.

PERAK-UJUNG TRANSMISSION LINE UPRATING (SURABAYA)

For the past decade, PLN’s power system in Surabaya has lacked a 5-km link needed to complete its 150 kV transmission ring. The existing line on this route was installed at 70kV, but in recent years has been operating at only 20 kV. Following the meeting, PLN staff, together with the assessment team, inspected the full 5-kilometer length of the project.
For the uprating, the existing right-of-way would be used, but new steel towers would be installed. The line passes entirely through the Surabaya Port Authority and an Indonesian Naval base, where a 200m segment of the line runs underground. The already-elevated span across the Kali Mas, a small river, would be raised higher, to assure the passage of sailing vessels. The Navy and the Port Authority have requested that the line be run underground. This would be significantly more costly, but PLN is seriously considering the request. In the long term, a buried line eliminates the possibility of any aerial accidents, and removes towers and wires from the landscape. During construction, local traffic would likely be affected more by the trenching work involved, but this would be temporary and manageable.

Potential environmental and social damage caused by the Perak-Ujung line would be minor to insignificant. This subproject would be considered a Category B project under World Bank procedures.

Under AMDAL guidelines, however, this proposed subproject would require a full ANDAL study. Guidelines on projects subject to AMDAL review, released by the Ministry of Environment in 2001, include projects involving new transmission lines of 150 kV or higher.\(^2\) It may be that the basis for requiring assessments for 150 kV lines is concern about the size of towers and right-of-way involved, or possibly concern about electromagnetic effects at that voltage.

Because this is an upgrade of an existing line, of short (5 kilometer) length, with no likely change in physical impact or in threat to any social group, PLN should consider requesting an exemption from the ANDAL study requirement. This project seems to merit a simple UKL/UPL study only.

### 5.4 Project Alternatives

Nearly all of the subproject investments currently planned for the JBPSRS Project are for completion, maintenance, or improvement of existing transmission assets. These activities should significantly increase the efficiency of existing power generation units, reduce transmission losses, and provide additional power for end use without increasing fuel consumption or wastes and emissions. The primary alternatives are either:

1. do nothing; i.e. do not complete these improvements in existing transmission infrastructure; or
2. apply the same funds to further efforts at end-use efficiency improvements and demand side management.

The first option means continued bottlenecks and inefficiencies. This in turn creates an artificial demand for new power generation capacity, which, if it were constructed, would be constrained by the same bottlenecks. Investments in rationalizing existing infrastructure are inherently an environmentally attractive approach. From a social perspective, rationalizing existing transmission infrastructure also is attractive. A high percentage of Indonesian households do not yet have access to grid or off-grid power, and demand for power on Java-Bali has been

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\(^2\) In Environmental Ministry Decree Number 17 of 2001, *Types of Business and/or Activity Plans that are Required to be Completed with the Environmental Impact Assessment.*
increasing at roughly 10 percent annually, even during the economic crisis years since 1997. Although pricing of inputs and retail power sales is a complicated subject, in principle, if PLN improves the operational efficiency of its existing system assets, the cost and availability of power will be improved for all of society. PLN already has a significant demand side management program underway, which certainly could be strengthened through additional investment. But a first priority is to assure system efficiency, and that logically starts with the existing infrastructure base.
The JBPSRS Project is to be a Sector Investment Loan (SIL), comprised of numerous subproject activities. The types of activities and the geographic coverage of the subprojects will be set under the loan and project agreements, but PLN, as the borrower and implementer, will determine the actual subprojects that are funded from the loan.

As described in Part III, the subprojects currently identified for funding under the loan are all upgrades and improvements to the existing transmission and subtransmission system. All of the currently planned subprojects would be considered as Category B activities under World Bank environmental assessment procedures. In the language of OP 4.01, their “potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are .... site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed ... readily.” However, in accordance with the environmental regulations as per Ministerial Decree No. 17/2001, all 150 kV transmission projects are required to undertake AMDAL.

Therefore an environmental management plan (EMP, RKL) is included here. This EMP outlines the procedures and measures that PLN will take to insure that: (i) all subprojects are screened for potential adverse environmental and social impacts; (ii) full environmental and social assessment—incorporating public consultation—is conducted if needed for any subproject in accord with both Indonesian and World Bank requirements; and (iii) reasonable and cost effective mitigation measures are applied as needed and in a timely fashion. This EMP identifies the relevant procedures and protocols under which PLN will operate for the project, and specifies a Monitoring and Reporting process. A strategy for Institutional Strengthening is also included.
Chapter 6 ASSESSMENT AND MITIGATION

6.1 Screening of Subprojects

As described in Chapter 7, PLN will establish a JBPSRS Project Environmental Team (PET), to work in association with the overall JBPSRS Project Implementation Unit. The PET will oversee and coordinate all aspects of this EMP. Implementation of mitigation measures and of any needed environmental assessment work will be carried out by the responsible PLN project operations office or PLN Project Team. The PET will also work closely with the proposed Community/Health/Environment/Systems/Sustainability (CHESS) group proposed for PLN’s Central Office. A general schematic of these responsibilities and relationships is presented in Figure 6A.

Figure 6A. Project Organization for Implementation of Environmental Management Plan

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1 Names for groups used in this presentation to describe the planned organizational structure of the project may be revised in the final loan agreement.
The PET’s first task will be to screen each of the subprojects or activities that is to be funded and implemented under the JBPSRS Project for its likely environmental and social impact, so as to determine its status under AMDAL requirements and World Bank Safeguards, and in particular to ensure that any associated impacts are consistent with an Environmental Category rating of B. A general checklist of potential environmental issues for power transmission and substation projects is provided in Table 6A, and a checklist for World Bank Safeguard topics of concern is presented in Table 6B.

**Table 6A. Power Transmission Lines and Substation Development: A Quick Checklist of Likely Impacts**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Likely</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>150kV or higher transmission line (AMDAL threshold)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of access road(s) leading to the site</td>
<td></td>
<td></td>
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<tr>
<td>Increased traffic due to transportation of construction and operation personnel and machinery</td>
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<td></td>
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<tr>
<td>Site leveling and development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearing of vegetation in the Right-of-Way (ROW) and associated impacts of land use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation of existing households from site</td>
<td></td>
<td></td>
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<tr>
<td>Air and dust emissions during construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety issues pertaining to fuel storage tanks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise level during construction and operation phases</td>
<td></td>
<td></td>
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<tr>
<td>Changes in stormwater runoff due to clearing or grading</td>
<td></td>
<td></td>
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<tr>
<td>Loss of aesthetic value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decommissioning and disposal of substation and equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health effects of electromagnetic fields (EMF) of high voltage power transmission lines in the immediate vicinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening of remote lands to human activities, such as settlement, agriculture, hunting, recreation, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety issues arising from low-slung transmission lines or lines near human activity, e.g., buildings, roads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazards to low-flying aircraft</td>
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<td></td>
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<tr>
<td>Cultural and interpersonal impacts of workers brought in during the construction phase; possibilities for local employment during construction or operation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See also Table 5A.
Table 6B. Checklist of Areas of Concern to World Bank Safeguards

<table>
<thead>
<tr>
<th>Topic (Safeguard)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Habitats (OP/BP 4.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest Management (OP 4.09)</td>
<td></td>
<td></td>
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<tr>
<td>Cultural Property (OP 4.11)</td>
<td></td>
<td></td>
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<tr>
<td>Involuntary Resettlement (OP/BP 4.12)</td>
<td></td>
<td></td>
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<tr>
<td>Indigenous Peoples (OP 4.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestry (OP 4.36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety of Dams (OP/BP 4.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects in International Waterways (OP/BP 7.50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects in Disputed Areas (OP/BP/GP 7.60)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2 AMDAL Assessment

It appears that for all subprojects and activities likely to be conducted under the JBPSRS Project, the AMDAL requirements equal or exceed the World Bank Environmental Safeguards in rigor. Therefore—unless a subproject triggers one or more of the Bank’s Safeguards Policies or directives (Table 6B) that have not already been triggered (Section 2.1), which would mean that the subproject in question would not be eligible for Bank financing under the JBPSRS Project—the PET will focus its efforts on fulfilling AMDAL requirements and procedures. Doing so should also fully satisfy any applicable World Bank environmental assessment requirements under OP/BP 4.01, and land acquisition and compensation requirements under OP/BP 4.12.

If studies and preparation of either AMDAL or UKL-UPL are determined to be needed (Figure 6B), the PET will oversee the study process in collaboration with the PLN Project Team or operational implementing unit. If such studies are to be contracted out, the PET will review the terms of reference and contracting procedures, and provide advice to the project implementing unit. But it will not conduct the assessments. The PET will review the results of any such studies to ensure that they are satisfactorily completed and ready for submission to the relevant BAPEDALDA (local government).

6.3 Public Consultation

Consultation with the public at the local level, in the kecamatan (sub-districts) where the subproject activities will take place, has become an important component of the AMDAL process. Public participation is also critical to the World Bank environmental assessment process.
During the preparation of this report, PLN convened a public consultation in Surabaya on a planned subproject activity, the Ujung-Perak line uprating. The meeting is reported on in Annex D. This consultation was conducted at the municipal level, with representatives from most of the stakeholder groups: government agencies, landholders, local business, and community organizations, and academics. It was the first such project meeting conducted at PLN's Surabaya regional headquarters. All participants seemed to agree that the meeting was useful; it appears to have provided a good model for such meetings in the future.

PLN's existing procedures for public consultation are contained in the 1996 *General Policy Concerning the Establishment of Overhead Transmission Lines*:

"PLN survey teams will provide site-specific maps describing physical impacts and project needs. Prior to any land acquisition, PLN will conduct a public consultation and information campaign to inform the people of the project and to absorb their views on impacts, concerns, compensation procedures, resettlement options, and project activities. If necessary consultation programs can be assisted by qualified independent entity (i.e. university), who can provide informal door-to-door interviews to get reliable information and to establish close communication between the project and affected people. Consultation should begin at the same time as initial project surveys."

The current guidelines are adequate for the JBPSRS Project. But during the course of the Project, it will be timely to update and elaborate on the existing policy. Since 1996, when the current guidelines were issued, the role of local consultations in public projects has changed significantly, and AMDAL requirements have changed accordingly.
6.4 Mitigation of Impacts

A general list of Likely Impacts and Mitigation Measures for Power Transmission Projects is presented in Annex C.

Many of the potential impacts that would normally be of concern in an electric transmission project are unlikely to arise under the JBPSRS Project. For all subprojects as currently envisaged in the Project, no new transmission lines are included, and PLN already owns or has access rights to all of the land involved; therefore there will be no associated need for land acquisition or resettlement, and no dwellings, enterprises, or buildings will be adversely affected. (Any land acquisition and compensation which might arise for subprojects to be prepared during project implementation will be undertaken in accordance with the Project's Land Acquisition and Resettlement Policy Framework). PLN ceased using polychlorinated biphenyls (PCB's ) nearly three decades ago, so there are no PCB's even in the oldest equipment to be replaced or upgraded under this project. Pesticides are not used in clearing transmission rights-of-way. And the highest voltage transmission lines to be worked with are only 150 kV, below the threshold of serious concern, although an issue for which the government is developing new guidelines. As already described, none of the topic-specific World Bank Safeguards will be triggered by any of the subprojects anticipated, with the exception of OP/BP 4.12 which relates to land acquisition and compensation. So the principal issues will be good construction practices, coordination with other agencies and communities so as to avoid any traffic or other construction-related problems. These are all areas of normal day-to-day concern to PLN throughout its operations.

PLN's General Policy Concerning the Establishment of Overhead Transmission Lines is reproduced in Annex E. This policy provides detailed guidelines and report forms for planning and implementing projects, including for land acquisition and compensation. It is focused on construction of new transmission lines. Maintenance and improvements, such as will be conducted under the JBPSRS Project, are not explicitly addressed. Nor is the construction or uprating of transmission substations. Under the institutional strengthening component of the project, presented in Chapter 7, the PET would play an important role in working with PLN's central CHESS Group to strengthen and update the General Policy.

6.5 Land Acquisition and Resettlement

For all subprojects as currently envisaged in the Project, there will be no associated need for land acquisition or resettlement. However, any land acquisition and compensation which might arise for subprojects to be prepared during project implementation will be undertaken in accordance with PLN's policy and guidelines for land acquisition and compensation, as contained in the General Policy Concerning the Establishment of Overhead Transmission Lines (discussed above; see also Annex E). The land acquisition guidelines in the General Policy are based on a Presidential Decree issued in 1993 (Keppres 55/93) regarding compensation for losses due to public projects and Ministry of Mines & Energy Decree No. 975/2000. Again, while adequate for the JBPSRS Project, these guidelines need updating, which can be conducted during implementation of the project.
These specific policies and procedures applicable to any land acquisition and compensation which may arise during the course of project implementation have also been collated in PLN’s stand alone Land Acquisition and Resettlement Policy Framework for the Project.
6.6 Monitoring and Reporting

Monitoring is used to measure successes, challenges, and problems in meeting mitigation targets during implementation of a project. For the JBPSRS Project, this information should enable both PLN and the Bank to evaluate the success of mitigation as part of project supervision, and also to allow corrective action to be taken if needed. Information and reporting flows are depicted in Figure 6A.

Monitoring for the JBPSRS Project will be under the authority of the PET. The PET’s team leader should receive copies of all Project-related progress and other reports that may be required under the AMDAL process, and share them with all members of the PET.

In addition to the AMDAL reports, which are to be submitted as required to Indonesian agencies, the PET will prepare, every six months, an environmental summary report. This report would briefly describe:

- a list of new subprojects developed or approved for implementation, and the categorization of their likely environmental impact;
- a summary of progress of any AMDAL studies in progress;
- a summary of significant mitigation measures, if any, undertaken during the previous six months;
- a description of any significant problems or successes in environmental mitigation during the period; and
- identification of any notable environmental or social events anticipated during the coming six months.
Since 1995, PLN has received loans and funding support not just from the World Bank, but also from the Asian Development Bank, and from the Japanese Bank for International Cooperation (JBIC). Each of these financial institutions has their own distinct set of environmental and social regulations and requirements for project lending. While there is overlap, especially for environmental and social assessment, each institution has a distinct set of procedures, with significantly different thresholds and reporting requirements. Furthermore, the requirements under these policies and procedures continue to evolve over time. As a result, PLN approaches each new IFI-supported project and its concomitant environmental and social assessment and mitigation procedures on an ad hoc basis. There is no uniform practice.

In recent years, Indonesian AMDAL requirements have also evolved, and become more comprehensive. With the decentralization of governance generally, oversight of the AMDAL process has also been decentralized. AMDAL reviews are now designed, conducted, reviewed, and decided at the local level. In addition, under the recent AMDAL revisions, public consultations are required. Generally speaking, the AMDAL requirements are as comprehensive and rigorous as those of the international financial institutions – and sometimes more so.

For PLN, perhaps the main difference between current AMDAL assessments and those of the international lenders is the tendency for PLN’s AMDAL assessments to be conducted by local Indonesian consultants – usually university-based environmental studies centers – while most environmental assessments for international funding review are conducted by international or joint international-Indonesian teams, fully or at least partly funded by the IFIs. There is still, often though not always, a significant difference in the quality of reports prepared by each group.

PLN understands that efforts are underway among the major IFIs – the World Bank, the Asian Development Bank, and JBIC, to harmonize their environmental and social assessment procedures and related safeguards. PLN wishes applaud and encourage these efforts.

In addition, PLN wishes to encourage these IFIs to consider the possibility of accrediting Indonesia’s AMDAL system, so that there would be a single system of EIA procedures for all projects in Indonesia. Perhaps the Institutional Strengthening component of the project could also assist in this effort. For PLN, the objective would be to help assure uniformly high quality across all of PLN’s environmental assessment work.
ANNEXES

A. Assessment Team and Terms of Reference  pages A1-3

B. Bibliography  pages B1-3

C. Summary of Likely Impacts and Mitigation Measures for Power Transmission Projects  pages C1-2

D. Report on Public Consultation for Perak-Ujung Subproject  pages D1-4

E. PLN’s General Policy Concerning the Establishment of Overhead Transmission Lines  pages E1-21
Annex A. Assessment Team and Terms of Reference

I. The Team

The assessment team was provided by Nexant, Inc., a Bechtel-affiliated energy services group. This work was conducted through Nexant’s International Energy & Environment Programs, based out of Washington, DC. Mr. Addison served as senior economist and advisor to the team.

Matthew Addison, Senior Vice President, International Energy and Environment (Washington, DC, and Jakarta) Mr. Addison served as senior economist and advisor to the team.

Ir. R.M. Sayid Budihardjo, Electric Power and Energy Consultant (Jakarta)
Ir. Budihardjo, provided support concerning technical, management, and institutional history aspects of all of PLN’s work, including its environmental programs.

Will Knowland, Senior Manager, Environmental Services (Washington, DC, and Jakarta) Mr. Knowland served as Team Leader for the assessment.

Ali Mumtaz, Environmental Engineer (Washington, DC and Jakarta) Mr. Mumtaz provided principal field investigations for the assessment.

Alfred Picardi, Environmental Assessment Consultant (Arnold, Maryland) Mr. Picardi supported the team’s work on environmental safeguards in the power sector.

Isna Marifa, Managing Director, PT. Qipra Galang Kualita (Jakarta) Ms. Marifa provided specialist support regarding application of AMDAL procedures.

Yani Witjaksono, President, Yayasan Binu Usaha Lingkungan (YBUL) (Jakarta) Ms. Witjaksono, with support of YBUL staff, facilitated the public consultation process and all aspects of the team’s work.

David Zoellner, Energy and Environmental Management Consultant (Manila, Philippines) Mr. Zoellner assisted the team in accessing the ADB’s environmental assessment experience and general review of the assessment.

1 For further information, see www.nexant.com.
P.T. PLN (PERSERO)’s assessment work was conducted with the collaboration and support of the Corporate Planning Group, directed by Mr. Djoko Prasetyo. The team wishes to acknowledge the support and participation of Mr. Hardiv Situmeang, Director of Planning, and Mr. Sutisna Hermawan, Vice President for Quality Assurance and Environment, as well as that of Mr. Prasetyo, and of all of their staff. Also, the team wishes to acknowledge the support of Mr. Edi Sulistyo, Manager of Power Plant Business Development, P.T. Indonesia Power and that of his staff, both in Jakarta and in the field.

Finally, considerable appreciation is in order to those World Bank staff who initially arranged for the assessment, and have supported it throughout its preparation. In the Jakarta office this certainly includes Mr. Tom Walton and Ms. Farida Zaituni, and in Washington, Mr. Calum Gunn, Mr. Kurt Schenk, Mr. Mohammad Farhandi, and their colleagues from the Energy and Mining Sector Unit (EASEG) of the East Asia and Pacific Region.

II. Tasks

Nexant was contracted by the World Bank in April 2002 to assist both the State Power Company (PT PLN Persero) and State Gas Company (PT PGN Persero) to prepare the environmental and social assessment and environmental management plans needed for their infrastructural components earmarked for possible Bank financing under a new energy sector loan. Subsequently, the proposed loan has been reformulated into two separate loans projects, addressing each sub-sector and the individual agencies. The following summary and list of tasks is drawn from the contract’s full terms of reference.

Because these would be Sector Investment Loans (SILs) in which the individual investment subprojects are not known with certainty at the time of appraisal, the approach to be taken is to prepare Environmental Management Plans (EMPs) for each overall project, in conformance with OP 4.01, and the environmental assessment requirements (AMDAL procedures) of the Government of Indonesia (GOI). The EMPs will have three main purposes: (i) to identify and describe the relevant environmental and social issues pertinent to the range of possible investments and their geographic setting; (ii) to establish a screening process whereby projects not necessarily identified at the time of loan preparation will be subjected to the appropriate level of environmental and social assessment prior to implementation; and (iii) to provide technical and institutional recommendations and an overall policy framework for preparation and implementation of the Environmental and Social Assessments (EA/SA) and/or EMPs needed for individual investment projects. The EMPs will include or be accompanied by a policy framework and procedures for carrying out land acquisition and resettlement and, if the review of social issues shows it to be warranted, a framework for addressing the potential effects of investment projects on isolated vulnerable peoples.

As an important part of the assessment process, the World Bank requires public consultation, and wide dissemination of a summary document. The consultation process generally comprises two steps: (i) at the beginning of the EA/SA preparation, consulted groups are informed of the purpose and process of the proposed loan and policy reform; possible impacts are identified through a "scoping" exercise; and the groups’ substantive inputs are solicited; and (ii) at the end of the EA/SA preparation, the draft is shared with the same consulted groups, and reasonable consensus sought. Differences of opinion are recorded. This consultation process will need to be
carried out for both EMPs, and each EMP should include guidelines for consultation in connection
with preparation of any EA/SAs, Land Acquisition and Resettlement Action Plans (LARAP), and
Isolated/Vulnerable Peoples Action Plans (IPAP) required for individual investments.

The Consultant will work closely with responsible staff at PLN and PGN, who will be asked
to provide much of the logistical support required. The consultants will rely chiefly on existing
data, documents and studies already available.

Specific Tasks

Task 1: Identify and describe potential environmental and social issues and assess
applicability of various Bank safeguards

Task 2: Carry out initial consultation of stakeholders

Task 3: Evaluate the regulatory and legal basis for environmental monitoring and
management and the institutional arrangements and capacity for implementing those
functions.

Task 4: Define the screening procedure for individual investment projects

Task 5: Develop guidelines and procedures for preparation, review, approval and
monitoring of implementation of environmental studies and management plans for
investment projects

Task 6: Prepare Land Acquisition and Resettlement Policy Framework

Task 7: Prepare guidelines for public information and consultation.

Task 8: Institutional arrangements and needs for strengthening

Task 9: Prepare draft EMPs

Task 10: Conduct public consultation to obtain comments and inputs for draft EMPs

Task 11: Prepare final EMPs for public disclosure and submission by Borrowers to the
Bank
Annex B

Bibliography

**INDONESIAN EA/SA REPORTS**


**INDONESIAN AMDALs**


JAVA-BALI POWER SECTOR RESTRUCTURING AND STRENGTHENING PROJECT
Environmental & Social Assessment / Environmental Management Plan


**NATIONAL LAWS**

Law No.15/1985 : The Electrical Power Act (Amendment is in progress)
Law No. 5/1990 : The Conservation of Biological Natural Resources and the Ecosystem.

**GOVERNMENT REGULATIONS**

Government Regulation No.41/1999 on Forestry.

**PRESIDENTIAL DECREE**


**MINISTERIAL DECREES**


Decree of the State Minister of Demography and Living Environments No. 02/MENKLH/1988 on the Guidelines of Environmental Quality Standards.

Decree of the State Minister of Living Environments No.17/2001 on the Types of Business Enterprises or Plans and Activities requiring Environmental Management Plans.


Circular of the Minister of Demography and Living Environments No.31/ SE/MENKLH/6/1987 on the Procedure for the Abatement of Pollution and Damage of the Living Environments.
DECREES FROM INSTITUTIONS BELOW THE MINISTERIAL LEVEL

Decree of the Chairman of BAPEDAL (the Institution for the Control of Environmental Impact) No.KEP-056/1994 on the Guidelines for the Classification of Significant Environmental Impacts.


WORLD BANK EA/SA


GENERAL EA/SA


# Annex C. Summary of Likely Impacts and Mitigation Measures for Power Transmission Projects

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation</th>
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<tbody>
<tr>
<td><strong>Access Roads</strong>&lt;br&gt;The construction of access roads can impact the environment through vegetation clearance and compaction of land. Access roads can open a way for natural resources that are presently difficult to reach.</td>
<td>Access roads may be temporary and returned to their original state after construction. Some may be retained for maintenance of the lines by PLN or for the community’s use. PLN will consult with the Local Authorities as to which roads to retain. Access roads adjacent to sensitive areas will be closed after construction and rehabilitated to prevent increased poaching of wildlife. Existing roads will be used as much as possible. Great care will be taken to minimize the number of access roads constructed.</td>
</tr>
<tr>
<td><strong>Right-of-Way (ROW)</strong>&lt;br&gt;Possible interference with or fragmenting of land uses along the ROW. Opening of remote lands to human activities such as settlement, agriculture, hunting, recreation, etc. Construction of the ROW can result in the loss and fragmentation of habitat and vegetation. These effects can be significant if natural areas, such as wetlands or wildlands are affected, or if the newly-accessible lands are home to indigenous peoples.</td>
<td>The width of the ROW will be kept to a minimum</td>
</tr>
<tr>
<td><strong>Increased Traffic</strong>&lt;br&gt;Disruption of traffic, and safety of local inhabitants and workers during the construction of transmission lines.</td>
<td>PLN, or its contractor, will have a traffic management plan based on defensive and preventive measures. Disruption of traffic will be minimized as much as possible. Every attempt will be made to avoid community-farming areas and not disrupt community access to their land</td>
</tr>
<tr>
<td><strong>Construction of Campsites</strong>&lt;br&gt;Construction camps can impact the environment through vegetation clearance, compaction of land, and improper management of solid and liquid wastes</td>
<td>PLN, or its contractor, will ensure that the campsites are cleaned up and revegetated after decommissioning. A campsite management plan will be prepared that will include a monitoring plan for management of activities on the campsite.</td>
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Adjacent Communities
Communities affected by the construction of transmission lines expect employment, improved standard of living and business opportunities.

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<th>Impact</th>
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<tr>
<td>PLN will maintain confidence of the community by:</td>
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<tr>
<td>- Keeping the public informed about the project,</td>
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<tr>
<td>- Employing local labor whenever possible;</td>
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<tr>
<td>- Buying local goods and services and encouraging local entrepreneurs to provide them; and</td>
<td></td>
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<tr>
<td>- Respecting local traditions and culture.</td>
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Construction of Transmission Line Towers, Tower Pads, and Substations
Clearing of vegetation, site compaction and land acquisition can change land use patterns.

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<th>Impact</th>
<th>Mitigation</th>
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<tbody>
<tr>
<td>Proper planning of the transmission lines' routes will minimize clearing of vegetation. Compensation rates for land acquisition are to be determined through public consultation and consultation with the local authorities.</td>
<td></td>
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</table>

Air and Dust Emissions
During the construction of access roads, substations and clearing of vegetation along the ROW.

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<tr>
<td>PLN, or its contractor, will use water sprinklers when dust becomes a potential nuisance to the surrounding communities.</td>
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Noise
Noise resulting from access road and transmission line construction may disturb the neighboring communities and local fauna.

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<tr>
<td>Noise from construction of access roads, if any, will be temporary and limited to daytime only. There is no large machinery involved in the construction of transmission lines.</td>
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Influx of People
Temporary influx of skilled labor during the construction of transmission lines and its interaction with locals.

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<th>Impact</th>
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<tbody>
<tr>
<td>Responsibility of the site manager to avoid unnecessary interaction of labor with the local communities.</td>
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Electromagnetic Fields (EMF)
The strengths of both electric and magnetic fields decrease with distance from transmission lines. The scientific community has not reached a consensus on specific biological responses to EMF, but the evidence suggests that health hazards may exist.

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<th>Impact</th>
<th>Mitigation</th>
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<tr>
<td>PLN abides by Indonesian guidelines, which are based on WHO suggested guidelines.</td>
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</table>

Safety issues from transmission lines
Placement of low-slung lines or lines near human activity (e.g., highways, buildings) increases the risk for electrocutions. Towers and transmission lines can disrupt airplane flight paths in and near airports and endanger low-flying aircraft, such as those used in agricultural management activities.

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<th>Impact</th>
<th>Mitigation</th>
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<tbody>
<tr>
<td>Technical guidelines for design and regular maintenance of transmission lines will minimize this hazard.</td>
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</table>
Annex D. Report on Public Consultation for Perak-Ujung Subproject

A public consultation meeting for the Perak-Ujung 150 kV Transmission Project was held at PLN’s Surabaya offices on 10 July 2002.

A list of participants is attached. The agenda for the meeting was:

1. Opening Remarks by Mr. Indra Pribadi, Head of the Pikitring Java Bali Planning Division
2. PLN Transmission Project Development Planning and Scope of Activities by Mr. Hengki Wibowo, PLN Prokitring
3. World Bank Environmental and Social Guidelines, Mr. Kabul Sutiyono, PLN PST
4. AMDAL Implementation Within Regional Autonomy, Mr. Andin, Dinas Environment the City of Surabaya
5. Discussion

Mr. Indra Pribadi explained that the purpose of the meeting was to inform stakeholders about the project and to invite input and suggestions from invitees. He also introduced the various participants and presented an outline of the meeting agenda. He continued by giving an overview of the PLN Java-Bali Transmission Project, including the organization structure, the area covered by PLN East Java. He showed a map of the 500 kV transmission line system in Java before describing the electricity capacity situation in East Java. He explained that the purpose of the proposed 150 kV line is to maintain East Java’s electricity service, especially in the Perak-Ujung area. There is already a 70 kV line. Mr. Pribadi emphasized the importance for PLN to conduct an AMDAL study in line with government regulations.

Mr. Hengki Wibowo provided information about the project location, showed a map of the proposed 150 kV transmission line from Perak to Ujung, and provided a brief description of the project development process. He also informed participants that an AMDAL study would be conducted to assess the impact of the project on the environment and local communities. He explained that funding for the project would come from IBRD, Government and PLN operational budgets. He also mentioned the importance of maintaining continuous dialogue between PLN and the community and related parties during the entire nine-month project development phase. By
comparing the impact of similar projects in matrix form, he concluded that the overall environmental impact of the project was unlikely to be significant.

Mr. Kabul Sutiyono elaborated on the environmental and social aspects of the project. He emphasized that most of the proposed 150 kV line would be installed along the existing 70 kV line. Steel poles would be installed, and in the area of Kali Mas the line would be higher overhead than the present one. Mr. Sutiyono said that in the absence of an Indonesian standard for magnetic and electrical field impact, PLN would follow WHO standards. During construction there would be some adverse impact to road users and PLN will be committed to current regulations. Most of the work would be done in the evening when the traffic is clear. Mr. Sutiyono confirmed that PLN had experience in developing similar transmission line projects, and said that the potential environmental and social impact caused by the project would likely be negligible. He also mentioned the importance of stakeholders’ input during project planning and development, and gave a brief explanation of World Bank Guidelines relating to the Environment and Public Consultation process.

Mr. Andin explained AMDAL implementation in the regional autonomy era, and discussed the importance of community participation in the AMDAL development process. Previously the environmental division existed only in the form of a secretariat. After regional autonomy the division became Dinas Lingkungan Hidup, which is now also responsible for the technical aspects of AMDAL. Mr. Andin said that the city of Surabaya would only be responsible for assisting the project within the Surabaya area. If the project lies across more than one Kabupaten, the responsibility will lie at provincial level. The regional government decree on AMDAL has been formalized; however it has not been issued yet owing to the recent mayoral appointment. Therefore AMDAL is still under provincial control. Since the 150 kV line project is seen as critical, as it will provide considerable benefit not only to the community, but to the region as a whole, it is important to have a common perspective on the project. Based on Government Decree No.17, an AMDAL study will be required, because it involves the installation of a 150 kV line.

Discussion

Ports Authority: The Ports Authority sent a letter to PLN on 23 November 1998 requesting that PLN use underground cables. It is hoped that PLN will use this letter as a reference in their planning.

Communication and Transportation: It will be necessary to coordinate with related institutions during road excavation, so traffic control can be easily organised with responsible institutions. Road excavation work should be conducted in the evening since traffic in Tanjung Perak is very heavy.

Permits and Requests: Pelindo and the Indonesian Navy (angkatan laut) have issued the requisite permits. The Navy has requested that there be no overhead cables. Pelindo has requested that SUTT (overhead cable) not be used since it will disturb activities in port areas.

PLN has determined that ground clearance should be a minimum of 18 meters, and will use SUTT, as using SKTT (under-ground) would increase the cost. Thus far PLN has already determined overhead lines and the construction method will adjust to the condition in order to minimize the impact on the community.

Every month PLN will hold a coordination meeting with the regional government to discuss activities of every unit of PLN East Java.
It will be necessary to coordinate between PLN, Port Authority, Navy, PT PAL and two Kecamatan where the project will be conducted. From now on it is hoped that top management will pay attention to problems occurs in the field.

PLN will coordinate with Dinas and related institutions. The project supervisor will coordinate with Kecamatan.

NGOs have requested that the impact of transmission line to flora and fauna should be reviewed, and the results should be announced to the community. They have also requested that community involvement in the AMDAL process be extended and hopes that community involvement will not be limited to public consultation meetings but also can be accepted as a partner for PLN. So, the community can also monitor and control project activities. So far, community involvement in the AMDAL process has been very limited.

The AMDAL process will be transparent. Further public consultation will be conducted at the Kecamatan level, all related institutions and representative of communities will be invited. So communities and all related institutions will be well informed about the project. Inputs and concerns received during public consultation meetings will be integrated into the AMDAL document.

Airlangga University needs some input as to what extent the community should be involved in the AMDAL process. In several projects, the community wanted to get involved in detailed project activities.

For the next project, it is important to conduct environmental and social reviews before determining technical aspects of the project.

AMDAL for this project will be under the environmental office of the East Java province.

Conclusions

Based on the above, the following conclusions can be drawn:

1. Project socialization at Kecamatan level should be conducted in order to involve more local stakeholders (i.e. communities).

2. Partnerships with related institutions should be developed as part of the AMDAL process, to ensure that full transparency occurs.

3. Technical reviews on the transmission project should be conducted in order to measure the impact on port authority and navy activities.

4. Community support of the project is necessary because of the importance of the project to the East Java region.
Participants: Public Consultation Meeting Perak-Ujung Project, 10 July 2002, PLN Regional Office Surabaya

1. Mr. Abu Yazid Secretary Kelurahan Ujung
2. Mr. Sumarno Camat, Semampir
3. Mr. Satoto Kecamatan Semampir Staff
4. Mr. Wasito PLN Prokitring
5. Mr. Bambang Soemarji PLN Prokitring
6. Mr. Inah PLN Prokitring
7. Mr. Kabul Sutijono PLN Central
8. Mr. Suparman Staff Kecamatan Pabean Cantikan
9. Mr. Hengki Wibowo PLN Prokitring
10. Mr. Sukismarto DLLAJ East Java
11. Mr. Ach. Sudjadi Dinas Transportation
12. Mr. A. Syahroni PLN Prokitring
13. Ir. M.R. Lubis PLN Prolitring
15. Mr. A. Hutomo PLN Prokitring
16. Mr. Maryono PLN Prokitring
17. Mr. Soeparmin PLN Prokitring
18. Mr. Singgih PLN Central
19. Mr. Haddi Moelyo PLN JBN
20. Mr. Untung Sukardi PLN JBN
21. Mr. Diyah S. (Moderator) Bapedal East Java
22. Mr. Dyah Larasayu Bapedal East Java
23. Mayor Daruwanto Lantamal III
24. Lettu Sutarman Lantamal III
25. Mr. Agoes Soegianto Lemlit University Erlangga
26. Ir. Andin Dinas Environment the City of Surabaya
27. Mr. Parno TD Dinas Environment the City of Surabaya
28. Mr. Oce S. UBS P3B
29. Mr. Heru Gani Pertamina
30. Mr. Suyanto Pertamina
31. Mr. Umartono UBS P3B
32. Mr. M. Rameli R&D Institute Technology Surabaya (ITS)
33. Mr. Siswaji Port Authority
34. Mr. A. Baroto Pelindo III
35. Mr. Basuki Cab Tanjung Perak
36. Mr. Warsilam Cab Tanjung Perak
37. Mr. Sardiyoko Staff WALHI (NGO) East Java
38. Mr. Moch Hasan PT Djakarta Lloyd
Annex E. PLN’s General Policy Concerning the Establishment of Overhead Transmission Lines

1. **General Overview** – PLN’s compensation and rehabilitation policy follows from the national regulations on land acquisition (Kepress 55/93), whose purpose is to ensure that people whose land is acquired for national development needs should be compensated with rates for all land and fixed assets at their replacement costs; i.e. sufficient so that the owner can find a better or equivalent replacement. Wherever possible, PLN will explore all opportunities to avoid land acquisition and displacement through engineering alternatives. Where impacts are unavoidable, PLN will ensure that all affected people, as participants in national development, are better off or at least no worse off than they were prior to the project. Compensation for all assets acquired by PLN will be provided at their replacement costs. PLN will also promote public understanding of the land acquisition process through community information campaigns, public awareness programs, community-level assistance, and the establishment of grievance procedures and local field monitoring to help address any problems experienced by communities affected by PLN projects. This policy will be followed by all PLN offices and should be supported by all related Government Bodies concerned with transmission line.

2. **Relevant Laws, Policies, and Regulations** – (see appendix 9). All land acquisition in Indonesia is regulated by Presidential Decree (Kepress) 55/93 concerning Land Acquisition for the Development of Public Interest. Additional relevant regulations include:

   a) State Act No 5 – 1960 concerning Basic Principles on Agrarian

   b) State Act No. 5 – 1974 concerning Basic Principles on Administration in The Region and Elucidation

   c) State Minister/Chief of The National Land Use Agency No. 1 – 1994


f) WHO Recommendation IRPS 1990/INIRC Guidelines of Limits of Exposure to 50/60 Hz Electric and Magnetic Fields (EMF)

3. **Definitions** – (see appendix 8) This policy covers all people affected by PLN transmission line projects, irrespective of their land tenure status. “Projects” include all impacts associated with PLN activities, such as land acquisition associated with the need for access roads. Families losing all of their productive assets (farmland, house or business), or in cases when the remaining assets are not economically viable, will be entitled for full compensation for the remainder of their land or property at replacement cost and to rehabilitation assistance that allows them to enhance or at least maintain their standard of living. All families affected by the PLN project who are present at the time of the baseline survey are eligible for compensation.

Clearance Space means the space around the conductors formed by the Minimum Clearance to the objects as defined by PLN technical guidelines where no residence or physical intrusions are permitted. Areas where PLN requires temporary passage but no permanent acquisition are called easement areas. Land and other assets acquired for clearance spaces or easements will be compensated at their replacement costs.

4. **Avoiding or Minimizing Impacts** – Projects will seek to minimizing all physical impacts by exploring alternative route alignments. Special attention will be given to avoiding as much as possible areas with dense populations, schools and other public facilities, shopping areas, and housing developments. Where there are no options, projects should use lattice extended towers to raise the clearance space so that it is situated above the building of at least the minimum clearance allowed (see Table – MM&E Regulation No. 01.P).

5. **Public Information and Participation** – PLN survey teams will provide site-specific maps describing physical impacts and project needs. Prior to any land acquisition, PLN will conduct a public consolation and information campaign to inform the people of the project and to absorb their vies on impacts, concerns, compensation procedures, resettlement options, and project activities. If necessary consultation programs can be assisted by qualified independent entity (i.e. university), who can provide informal door-to-door interviews to get reliable information and to establish close communication between the project and affected people. Consultation should begin at the same time as initial project surveys.
6. **Compensation and Rehabilitation** (see Appendix 8 & Appendix 10) – Land acquisition policy refers to Keppress 55/1993 and its implementing regulations. Land acquisition and compensation should be done directly between PLN and affected people. Compensation will be provided for all land and houses purchased by PLN (i.e. for towers, substations, access roads, etc.) and for all objects acquired within the clearance space. Compensation rates for all land and fixed assets will be at their replacement costs; i.e. sufficient so that the owner can find a better or equivalent replacement. This activity will involve the Camat, the Kepala Desa, and the affected family. Land acquisition mapping will be done by BPN (Badan Pertanahan Nasional). Project maps and compensation lists will be posted locally, in the office of the Lurah and project office, where they will be visible to the affected people. Where resettlement is necessary, PLN will develop resettlement options that can include cash payments or equivalent, replacement land as described by Government Regulation, or other forms of assistance based on discussions with the resettler families. All families affected by the project activities should have the opportunity improve or at least recover their living standards.

7. **Procedure**

a. PLN purchases land, plant, houses that exist in foundation locations for towers, and all fixed assets i.e. trees & buildings within Clearance Space (see M M & E Regulation no. 01.P Part Three – Article 5 item (2),(3), & (4)) at replacement rates as defined in Para. 6, above. Easements will also be paid at replacement cost (see M M & E Regulation No.01.P Part three - Article 5 items (6) & (7); Part one – Article 3 items (2) & (3); Part two – Article 4 items (2) & (3)).

b. The procedure for land compensation is as follows:
   - Guidance & Counseling-- The PLN Project Team in, cooperation with the head of Subdistrict & head of Village, provides a special meeting with the project affected people (PAPs) regarding the project and to elicit their views and concerns. PLN’s public information brochure should be distributed at this time.
   - Public Consultation with the project affected people will be conducted by the PLN and involve related Government agencies. Agencies will provide all necessary information about the project and related matters, including the timing and procedures for compensation.
   - The next step is to stake out the boundaries of the needed land.
   - Then follows the detailed mapping of the land holdings.
   - After the maps are completed, the inventory of crops, vegetation, buildings and other assets will be conducted.
   - The next step is to prepare the list of the acreage of the land holdings, structures, and the volume of the affected crops.
   - PLN prepares a list of compensation for land and assets based on the replacement cost. The guiding principles to determine replacement
costs are described in Appendix 10. Any transaction costs, as defined in this policy (para 6), will be provided by PLN. Records will be kept and reported, and made available to the affected people.

- The final price of the properties should be negotiated between both parties (PLN & PAP) to reach full agreement that compensation reflects replacement costs.
- The final list should be approved and signed by both parties.

Grievances that cannot be resolved locally should be resolved through the procedures defined by Kepress 55/93.

- The final step will be payment of the compensation directly to the landowners and other affected people as agreed between PLN and the project affected people.

8. **Responsibilities and Grievance Procedures** – (see appendix 1). PLN will remain ultimately responsible for ensuring that people affected by project activities receive the compensation defined by this policy. To ensure that this policy is carried out effectively, each project will appoint a “resettlement officer” reporting to the Project Manager (Pimpro). Resettlement officers will ensure that all required activities are carried out promptly. Resettlement officers will receive all necessary logistical and staff support. Pimpros should make special efforts to ensure good community relationships and to promptly resolve compensation problems and complaints. Problems that cannot be resolved satisfactorily should be resolved through discussions with assistance from the responsible local government authorities. Monitoring by PLN Pusat, with assistance a qualified independent entity if needed, will ensure that all people affected by PLN projects receive compensation and any agreed rehabilitation assistance as defined by this policy.

9. **Planning Policies** – Resettlement plans will be prepared for all transmission projects. Plans will include an identification of all anticipated impacts, compensation guidelines, implementation policies for land acquisition and resettlement, field assignments for PLN agents responsible for resolving problems, agreements with civil agencies, an implementation schedules linked to the anticipated civil works, and a detailed budget for compensation and any other necessary resettlement activities. Where more than five families are affected in any one site, more detailed information should be provided to indicate how production will be restored, such as through PLN’s assistance to identify and transfer equivalent productive land. These items should be summarized in the PLN overview sheet attached to transmission line project proposals for review. Compensation payments to affected families will be completed for each project before the start-up of physical works on the land.

10. **Reporting and Documentation** – (see appendix 2.1, 2.2, 2.3, 2.4, 3, 6.1 & 6.2) This information should be sent to PLN Pusat with each project proposal.

a. Resettlement preparation checklist;
b. Record of consultations and information disseminated;
c. Compensation table based on replacement cost (Appendix 10)
d. Project documentation land acquisition checklist for PLN staff;
e. Standard monitoring TOR (for qualified independent entity i.e. University);
f. Grievance rules and name of officer assigned to resolve problems;
g. Illustrated public information booklet explaining:
   - what PLN is doing (project description and map)
   - process that is about to happen (para. 7b)
   - compensation policy and local rights
   - where to complain or inquire
Transmission Preparation Checklist
For all Projects

1. **Baseline survey (house-to-house)** – (see appendix 7.1 & 7.2)
   a. List of physical items requiring land acquisition (i.e. towers, access roads)
   b. No. of people affected (KK)
   c. No. of people displaced (KK)
   d. No. of houses acquired (meters and units)
   e. No. of farms acquired (meters and units)
   f. Major source of income
   g. Area of land acquired
   h. Land tenure status
   i. No. of trees, buildings, and other assets
   j. No. of public building acquired (meters and units)

2. **Public information Campaign**
   a. Timetable for information campaign
   b. Record of meetings with head of village (Kepala Desa) and villages
   c. Distribution of information booklets (number and dates)
   d. Involvement of qualified independent entity (i.e. University) (see appendix 4)

3. **Resettlement**
   a. No. of families requiring replacement land, if any.
   b. Agreement with PAP & PLN (appendix 5)

4. **Detailed Budget** (as required)
   a. Land acquisition costs
   b. Other fixed assets (buildings, trees, etc)
   c. Community consultations and information costs
   d. Management and overhead
<table>
<thead>
<tr>
<th>Activities</th>
<th>Procedure/Regulation</th>
<th>Responsibility*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resettlement/ Land acquisition/ Compensation (property, buildings)</td>
<td>1. The Minister Mining and Energy Regulation number 01.P/47/M.PE/1992.</td>
<td>1. PLN Project</td>
<td>1. Relocation of housing located in the land to be used for tower location.</td>
</tr>
<tr>
<td></td>
<td>2. KEPPRES No. 55/1993</td>
<td>2. PLN Project</td>
<td>2. Compensation for land and houses/structures existing in land to be used for location of towers or within the clearance space.</td>
</tr>
<tr>
<td></td>
<td>3. Minister of Mining and Energy Regulation number 01.P/47/M.PE/1992.</td>
<td>3. PLN Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. KEPPRES No. 55/1993</td>
<td>4. PLN Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Minister of Mining and Energy Regulation No. 01.P/47/M.PE/1992.</td>
<td>3. PLN Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. KEPPRES No. 55/1993</td>
<td>4. PLN Project</td>
<td></td>
</tr>
</tbody>
</table>

* After project completion PLN's Maintenance & Operation unit will be responsible for compensation.
### TOWER LOCATION

<table>
<thead>
<tr>
<th>PAP/Protection Forest/Plantation etc.</th>
<th>Issue</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Land                                 | 1. Relocation       | 1. Perhutani (Ministry of Forestry) should find out the suitable area through the Committee for the Relocation of Forest, as replacement of forest area affected by the project. All relevant cost should be financed by PLN.  
S K BER No: 969.K/05/MPE/1989  
429/Kpts – II/1989  
436/Kpts – II/1991  
2. Compensation                      |                     | 2. PLN provides guidance, counseling and data collection for the acquisition for land. PLN purchases the land directly from PAPs (as listed in the inventory list).  
PLN starts project activities  
(KEPPRES No. 55/1993) |
| Buildings                            | 1. Resettlement     | 1. PLN provides guidance, counseling and data collection of buildings. PLN purchases buildings directly from PAPs (as listed in the inventory list). PAPs move to new houses by themselves.  
(KEPPRES No. 55/1993) |
| Trees                                | 1. Relocation       | 1. PLN collects data concerning trees within Perhutani area and provides the compensations for replacement of affected forest.  
S K BER No 969.K/05/MPE/1989  
429/Kpts – II/1989  
436/Kpts – II/1991 |
## OBJECT WITHIN CLEARANCE SPACE

<table>
<thead>
<tr>
<th>PAP/ Protection Forest/ Plantation etc.</th>
<th>Issue</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>1. Compensation</td>
<td>1. PLN provides guidance, counseling and data collection of buildings within the clearance space. PLN purchases all buildings within the clearance space directly from PAPs, as listed in the inventory list. (KEPPRES No. 55/1993)</td>
</tr>
<tr>
<td>Trees</td>
<td>1. Compensation</td>
<td>1. PLN collects data about trees within the clearance space, and then provides compensation to PAPs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(PERMEN No. 01.P/47/MPE/92)</td>
</tr>
</tbody>
</table>
## STRUCTURES OR OBJECTS DAMAGED DURING CONSTRUCTION

**INCLUDING SURVEY WORKS**

<table>
<thead>
<tr>
<th>Productive asset</th>
<th>Issue</th>
<th>Solution</th>
</tr>
</thead>
</table>
| **Land**<br>(Access road, temporary storage, etc.) | 1. Compensation | 1. PLN provides guidance, counseling and data collection for land acquisition. PLN purchases the land based on replacement values, and starts project activities.  
1. KEPPRESS No. 55/1993  
2. Minister of Mines & Energy Regulation No: 01.P/47/MPE/92 |
| **Buildings**<br>(Damages part of the building under T/L construction) | 2. Compensation | 1. PLN provides guidance, counseling and data collection of buildings within the clearance space. PLN purchases all buildings thing the clearance space directly from PAPs, based on compensation values.  
1. KEPPRES No. 55/1993  
2. Minister of Mines & Energy Regulation No: 01.P/47/MPE/92 |
| **Crops/vegetation** | 1. Compensation | 1. PLN collects data about trees within the clearance space, and then provides compensations to PAPs.  
Minister of Mines & Energy Regulation No: 01.P/47/MPE/92 |
## SUBSTATION LOCATION

<table>
<thead>
<tr>
<th>Productive asset</th>
<th>Issue</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Land             | 1. Relocation | 1. Perhutani (Ministry of Forestry) will find out the area through the Committee for relocation for forest, in replacement of forest areas affected by the project. All relevant costs will be financed by PLN.  

S K BER No: 969.K/05/MPE/1989  
429/Kpts – II/1989  

436/Kpts – II/1991  

2. PLN provides guidance, counseling and collects data for land acquisition. PLN purchases the land directly from PAPs (as listed in the inventory list).  

PLN starts project activities.  

(KEPPRES No. 55/1993) |
|------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Buildings        | 1. Resettlement | 1. PLN provides guidance, counseling and collects data for buildings. PLN purchases all buildings directly from PAPs (as listed in the inventory list).  

(KEPPRES No. 55/1993) |
|------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Trees            | 1. Compensation | 1. PLN collects data about trees within Perhutani area and provides compensations to Perhutani.  

S K BER No: 969.K/05/MPE/1989  
429/Kpts – II/1989  

436/Kpts – II/1991  

2. For PAP’s trees – Permen 01.P/47/MPE/92. |
## INVENTORY OF THE ASSETS AFFECTED BY THE PROJECT

<table>
<thead>
<tr>
<th>No</th>
<th>PAP (name)</th>
<th>DESCRIPTION ASSETS</th>
<th>QTY</th>
<th>Remarks</th>
</tr>
</thead>
</table>

PAP

PLN

(..................)  
(..................)  
Head of District/Sub District Village

(..................)
Statement Certificate
for the witness of the Public Information Campaign

The present certificate is made and endorsed the ................. day of the month of .................... in
the year of .................... concerning the participation to the execution of payment to PAP, according to the
inventory list established for this purpose and attached.

(i) University of .........................
(b) CERTIFICATE FOR THE ACQUISITION OF LAND

The Undersigned:

1. Name ..............................
   Age ..............................
   Nationality ..............................
   Occupation ..............................
   Address ..............................

states in the present certificate that this land lies at this land lies at subdistrict ......................, district ..................... regency ..................... with land certificate no ............. surface ............. sq.m, as described in cadastral mapping prepared by the National Land Bureau, Regency ..................... date ............. No ............., here below referred as “FIRST PARTY”.

2. Name ..............................
   Age ..............................
   Nationality ..............................
   Occupation ..............................
   Address ..............................

who for purpose of present certificate acts as PLN representative, as per the letter of Minister of Mines and Energy, here below referred as “SECOND PARTY”, and who stay at front of Head of District ....................., witnessed by:
   1. ..................... head of subdistrict .....................
   2. ..................... secretary of subdistrict .....................

declare as follows:

1. FIRST PARTY accept to release the land for public utility, so that the land will pass to the responsibility and control of Government.

2. The compensation for releasing of land under point (1) is agreed and stated by both parties, at Rp ............. ( ............. ), and has been received by FIRST PARTY.

3. FIRST PARTY guarantee that the land will be in use of SECOND PARTY, and forever not of other parties, and no other charges are due by SECOND PARTY.

............. date ............. 1993

SECOND PARTY

(Chief of PLN Project)

FIRST PARTY

(Chief of PLN Project)

witness:

1. Head of Subdistrict
   (..............................)
2. Secretary of Subdistrict
   (..............................)
(c) INVENTORY OF TOWER LOCATION

Drawing of present land situation for location of 150 kV towers:

Location : 
Subdistrict : ................................
District : ................................
Regency : ................................

Name (PAP) :
1. ................................ (..... sq.m)
2. ................................ (..... sq.m)
3. ................................ (..... sq.m)
4. ................................ (..... sq.m)

Remarks :

Signatures (PAP) :
1. ................................
2. ................................
3. ................................
4. ................................

Drawing of land situation

Date, ............... 
PLN Project

1. ................................
2. ................................

witness

Head of District 
(.............................)

Head of subdistrict 
(.............................)
(d) INVENTORY OF LOCATIONS OF SUBSTATIONS

Drawing of present land situation for location of 150 kV towers:

Location:
Subdistrict: ................................
District: ................................
Regency: ................................

Name (PAP):
1. ................................ (...... sq.m)
2. ................................ (...... sq.m)
3. ................................ (...... sq.m)
4. ................................ (...... sq.m)

Remarks:

Signatures (PAP):
1. ................................
2. ................................
3. ................................
4. ................................

PLN Project

Date, .................

Head of District

Head of subdistrict

(..............................)

(..............................)

E-16
(e) NOMINATIVE LIST CONCERNING LAND FOR LOCATION OF TOWERS.

Village: ........................................
Subdistrict: ....................................
District: ........................................
Regency: ........................................

Center line

<table>
<thead>
<tr>
<th>No</th>
<th>Tower</th>
<th>PAP</th>
<th>Land (sq.m)</th>
<th>Signature</th>
</tr>
</thead>
</table>

witness:

Head of subdistrict:  
Head of district:  
PLN project:  

(..............)  
(..............)  
(..............)
(f) NOMINATIVE LIST CONCERNING LAND FOR LOCATION OF SUBSTATIONS

Village : .............................
Subdistrict : ..........................
District : ..............................
Regency : ..............................

<table>
<thead>
<tr>
<th>No</th>
<th>Tower</th>
<th>PAP</th>
<th>Land (sq.m)</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
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Center line

<table>
<thead>
<tr>
<th>Center line</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

witness :

Head of subdistrict: (...............)
Head of district: (...............)
PLN project: (...............)

E-18
(g) TERMINOLOGY REVIEW

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearance space</td>
<td>Space around the conductor which formed by the minimum clearance to the objects. It is determined by factor such as voltage, temperature and wind. No objects or activities are permitted within the clearance space. (Regulation of the Minister of Mines &amp; Energy No : 01.P/47/.MPE/1992).</td>
</tr>
<tr>
<td>Easement</td>
<td>The right of access and payment of compensation for loss or damage.</td>
</tr>
<tr>
<td>P A P</td>
<td>All persons affected by PLN project irrespective of their land tenure status (Project Affected Persons)</td>
</tr>
<tr>
<td>N J O P</td>
<td>Selling value for taxable properties. (Base value used for payment of compensations)</td>
</tr>
<tr>
<td>E M F</td>
<td>Electro-Magnetic Field, which includes electric field and magnetic field. Standard values follow WHO recommendation – IRPA 1990/INIRC guide line limits of exposure to 50/60 Hz electric and magnetic field.</td>
</tr>
<tr>
<td>Qualified Independent-Entity</td>
<td>The independent entity which is entitled to work for evaluation of project impacts or related activities.</td>
</tr>
<tr>
<td>Local monitoring</td>
<td>The organization which is entitled for continuous monitoring of impacts due to project and related activities.</td>
</tr>
<tr>
<td>Resettlement</td>
<td>The act or process of the relocation of the house which is affected by the project.</td>
</tr>
<tr>
<td>Resettler</td>
<td>Person who can no longer remain in his house and need to be relocated.</td>
</tr>
<tr>
<td>Replacement Costs</td>
<td>The cost for replacement of affected assets. Replacement costs to be determined with reference to current construction costs of structures at a given local market at the time of acquisition plus the market value of the land, trees and crops as determined by sales in the last year in the local market (see Appendix 10).</td>
</tr>
<tr>
<td>Economic Viability</td>
<td>The remaining assets of the PAP plus the cash compensation for the loss allows the PAP to enhance or maintain his/her previous standard of living.</td>
</tr>
</tbody>
</table>
# RELEVANT LAWS, POLICIES AND REGULATIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Regulation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMF</td>
<td>1. PLN Standard (SPLN No. 112/1994)</td>
<td>1. E(max) : 10 kV/m and B (max) : 0,5 mT (working hour)</td>
</tr>
<tr>
<td></td>
<td>2. INIRC guidelines limits of exposure to 50/60 Hz -- electric and magnetic field/WHO recommendation – IRPA 1990.</td>
<td>2. E(max) : 5 kV/m and B (max) : 0,1 mT (continuously)</td>
</tr>
<tr>
<td>Clearance Space</td>
<td>1. The Minister of Mining and Energy Regulation number 01.P/47/M.PE/1992.</td>
<td>1. Regulation concerning clearance space of HVTL and EHVTL or minimum distance between ground/objects and HVTL/EHVTL conductors.</td>
</tr>
<tr>
<td>Easement</td>
<td>1. The Minister of Mining and Energy Regulation number 01.P/47/M.PE/1992.</td>
<td>1. Regulation concerning clearance space of HVTL and EHVTL or minimum distance between ground/objects and HVTL/EHVTL conductors.</td>
</tr>
<tr>
<td>Compensation for buildings</td>
<td>1. The Minister of Mining and Energy Regulation number 01.P/47/M.PE/1992.</td>
<td>1. Regulation concerning clearance space of HVTL and EHVTL or minimum distance between ground/objects and HVTL/EHVTL conductors.</td>
</tr>
<tr>
<td></td>
<td>2. KEPPRES No. 55/1993</td>
<td>2. Land procurement for development of public utilities.</td>
</tr>
</tbody>
</table>
REPLACEMENT COST LIST

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tbody>
</table>

1. Regional Public Service

Note:

PLN will determine the replacement cost of:

(a) agricultural land, by applying the market prices of land of productive potential in the vicinity at the time of acquisition;

(b) houses and other structures and homestead land, by assessing in the local market current construction costs of houses and other structures and current market prices of land at the time of acquisition;

(c) trees, by applying the market value;

(d) crops, by applying the market value of one year standing crops.

Compensation for trees and crops should be in an amount sufficient to cover the costs associated with their replanting. PLN may also consider market prices without depreciation and NJOP values for purposes of valuation and compensation provided that the valuation results in a compensation payment equal to, or higher than, the replacement cost determined above.

PLN may also retain the services of other qualified persons such as valuers, engineers and consultants or organizations to recommend rates of compensation based on the above mentioned principles of replacement cost.