

## Indonesia

### The Renovation of Dayeukolot Workshop Project

Field Survey: August 2003

#### 1. Project Profile & Japan's ODA Loan



Outskirts of Bandung City, West Java Province



Procured machinery in use

##### 1.1 Background

The Dayeuhkolot Repair Workshop<sup>1</sup> is controlled by the West and Central Java Production and Generation Business Unit of Indonesia's state electricity corporation (PT. PLN); the principal purpose of this workshop is to repair hydropower generation equipment parts such as the runners, liners, and guide vanes used in hydraulic turbines. While both the number and volume of items (hydropower generation, thermal power generation, transmission equipment) requiring repair was increasing in line with the growth of the region's electric power system, the majority of machine tools owned by the workshop were falling into disrepair, operating capacity rates were falling and the quality of repairs decreasing. There were concerns that this would adversely affect the stable operation of the power system, and the need to replace decrepit equipment had been identified.

##### 1.2 Objectives

The project's objective was to improve repair quality and revenues by developing a repair workshop in the west-central Java region, and thereby contribute to infrastructure improvements targeting economic growth through stabilizing power supplies in the region.

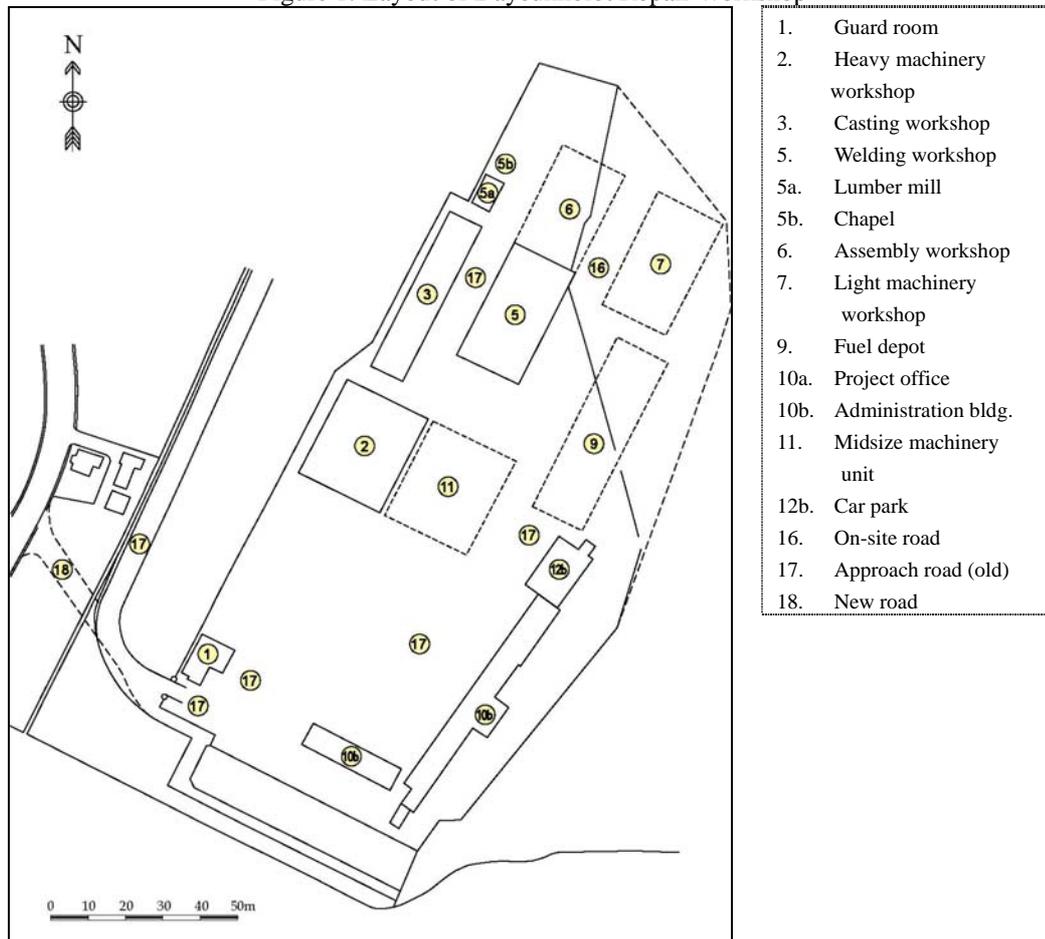
##### 1.3 Outputs

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<sup>1</sup> Located some 9km to the south of the capital city of Bandung in West Java Province.

1. Construction / rehabilitation of the repair workshop; installation of machine tools
  - Heavy machinery workshop: installation of heavy machine tools to enable the execution of key processes, e.g. runners, hydraulic turbine shafts, liners, etc., and rehabilitation of the building: 300m<sup>2</sup>
  - Midsize machinery workshop: rehabilitation of the decrepit workshop to create a new 750m<sup>2</sup> midsize machinery workshop
  - Light machinery workshop: introduction of machine tools for processing of small parts, ancillary machine parts; construction of a 700m<sup>2</sup> light machinery workshop on reclaimed marshland
  - Welding workshop: replacement of equipment / machinery used for bending, molding and welding hydraulic turbine runners, guide vanes, parts for ancillary hydraulic turbine equipment, the air heater elements that are auxiliary thermal power generators, etc.
  - Assembly workshop: installation of equipment / machinery for parts assembly and assembly testing of hydraulic turbine parts, e.g. runners, liners, hydraulic turbine shafts, guide vanes, etc.; and construction of a new 570m<sup>2</sup> assembly workshop
  - Other: depot: 900m<sup>2</sup>, construction of a new road: 400m<sup>2</sup>, on-site road: 2,000m<sup>2</sup>, rehabilitation of workshop entrance: 310m<sup>2</sup>, and reclamation of 3,300m<sup>2</sup> of marshland

Figure 1: Layout of Dayeuhkolot Repair Workshop



Source: Appraisal documents

## 2. Training & operational guidance

- Overseas training: dispatch of workers for overseas training in basic production and quality management, hydraulic turbine parts repair scheme design, basic assembly and testing skills, and heavy machinery processing skills
- Operational guidance: dispatch of foreign engineers to provide on-site OJT relating to basic production and quality management and basic repairs to hydraulic turbine parts

## 3. Consulting services

### 1.4 Borrower / Executing Agency

Republic of Indonesia / Perusahaan Listrik Negara (P.T. PLN: the state electricity corporation)

## 1.5 Outline of Loan Agreement

Loan Amount	793 million yen
Disbursed Amount	668 million yen
Exchange of Notes	December 1989
Loan Agreement	December 1989
Terms & Conditions	
Interest Rate	2.5%
Repayment Date (Grace Period)	30 year (10 years)
Procurement	General untied
Final Disbursement Date	December 1994

## 2. Results & Evaluation

### 2.1 Relevance

As stated in section 1.1, while the number and volume of items requiring repair increased because of expansion of power system of PT. PLN, the state electricity corporation, the Dayeuhkolot Repair Workshop failed to demonstrate sufficient performance due to decrepit of machine tools of the workshop. There were concerns that this would have an adverse effect on the stable operation of the power system; in targeting contributions to the stability of power supplies through the replacement of equipment at the workshop, this project was highly relevant at the appraisal time point.

The existence of quality repair facilities to ensure a stable and efficient supply of electrical power was still a priority for Indonesia's power sector at the evaluation time point, thereby ensuring the continued relevance of this project.

### 2.2 Efficiency

#### 2.2.1 Outputs

Most of the output components were implemented according to the original plans. Minor changes were made in consequence of the review (adjustment) of the equipment procurement requirements, which was undertaken on the basis of the results of the detailed design (D/D) and changes in repair needs (up-sizing), as follows: the fuel depot was reduced from the planned 900m<sup>2</sup> to 570m<sup>2</sup>, the heavy machinery workshop was expanded from 300m<sup>2</sup> to 810m<sup>2</sup>, and 14 instead of 11 transport vehicles were procured.

### 2.2.2 Project Period

The original plans cited a project period of 30 months starting October 1989 and ending in April 1992 (i.e. from L/A signing through the installation of machinery); however, the project actually spanned 54 months: from December 1989 through June 1994. The delays were caused by the aforementioned changes in outputs.

### 2.2.3 Project Costs

The Japanese ODA loan was initially scheduled to cover 85%, or 793 million yen, of project costs totaling 933 million yen. It was not possible to obtain data on total project costs that incorporated the local currency portion, but given that the actual amount of loan disbursement was 668 million yen (84.2% of the approved amount), it is assumed that total project costs were within the planned budget.

## 2.3 Effectiveness

### 2.3.1 Improvements in Repair Quality

The implementation of this project resulted in an increase in processing capacity, with length increasing from 6m to 7m, and weight limits from 0.5 tons to 1.2 tons (diameter remained at 2m), thereby enabling the Dayeuhkolot Repair Workshop to handle supplies and repairs of the large-scale parts used in hydropower plants. These machines are not currently used very frequently, but there are few repair facilities in Indonesia capable of repairing / producing these large-scale parts and the workshop is meeting the needs of PT. PLN, its principal customer, for repairs to such parts.

The project involved the replacement of decrepit equipment resulting in a substantial increase in the quality of repairs / production at the Dayeuhkolot Repair Workshop. Specifically, the machine tools procured through this project are predominantly being used for precision processing, which requires highly accurate operation.

Restructuring was undertaken in 1997, which resulted in the adoption of a customer-oriented business policy. In 1998, the workshop was certified by the International Organization for Standardization and it employs systematic quality management. As of 1999, the pass rate for

Fig. 2: Heavy lathe (project procurement)



Fig. 3: CNC lathe (project procurement)



in-house inspections of parts (produced) was 99.075% and the return rate 0.25%, indicating a high standard of quality management.

### 2.3.2 Improved Profitability

#### (1) Reduced Reliance on Outsourcing

Prior to the implementation of this project, domestic and offshore outsourcing by PT. PLN amounted to approximately 90,000 hours per year, with project plans calling for this figure to be reduced to around 4,000 hours post-completion. In 1998, outsourcing amounted to just 824 hours, meaning that the objective of reducing dependency on outsourcing has been accomplished by a wide margin.

At appraisal, it was anticipated that the repair division of PT. PLN's West and Central Java Production and Generation Business Unit would make every effort to bring the repair operations (business) of the executing agency in-house. As stated earlier, the present PT. PLN Service and Production Business Unit has diversified the range of products that can be handled at the Dayeuhkolot Repair Workshop as compared to at the project time point, and is developing its business by providing services to non-PT. PLN customers.

Fig. 4: Vertical boring machine (project procurement)



#### (2) Financial Internal Rate of Return (FIRR)

The FIRR for the project, as calculated at appraisal, was 8.9%. For the purposes of this calculation, benefits were taken to be the reductions in outsourcing costs, and costs to be project costs and operation and maintenance costs. Since financial data had not been consolidated when this evaluation was performed due to the effects of internal restructuring at the Dayeuhkolot Repair Workshop, available data was utilized and the following terms (assumptions) used for the calculation, which yielded a figure of 8.2%.

##### (1) Benefits:

- A. Since available data showed outsourcing amounting to just 824 hours in 1998, the same figure was used for subsequent years. It was assumed that outsourcing reductions (hours) increased gradually and at the same rate between the base year (project completion): 1994 and 1998.
- B. For unit processing costs, the appraisal figure of 49,000Rp/hr was used.

##### (2) Costs:

- A. For construction costs, the actual loan disbursement amount was used. The

local currency portion was listed as 15% of the construction costs.

- B. O&M costs for project procurements were listed as 82% of the O&M costs for the entire organization (the percentage of total project costs as cited above to total assets in 1998).

(3) Project life: 20 years (same as at appraisal)

As stated earlier, in view of the fact that the number of outsourcing hours per year, 90,000 hours pre-implementation, was reduced to 824 hours, a level that is dramatically lower than the planned figure, it is suggested that this project has had a considerable effect.

## **2.4 Impacts**

### **2.4.1 Stable Supplies of Electricity**

In supporting the efficiency of PT. PLN's power supply system, this project is contributing to the stability of electricity supply.

### **2.4.2 Environmental Impact**

Since appropriate measures were taken to deal with the impact of noise, vibration, toxic gas, smoke, and offensive odors on the environment in the vicinity of the workshop that were feared at appraisal, there have been no reports (of complaints), according to the executing agency. No problems were identified in the environmental impact assessment (EIA) performed by Bandung prefectural government in February 2003 either. This project did not involve any land acquisition or resettlement.

## **2.5 Sustainability**

### **2.5.1 Executing Agency**

#### **(1) Technical Capacity**

The average age of PT. PLN Service and Production Business Unit (PT. PLN Jasa dan Produksi) employees is 48, and efforts are being made to tackle the issue of maintaining production efficiency by securing young personnel and transferring the skills of experienced workers. PT. PLN Service and Production Business Unit uses skills-building under a planned program of education and training to increase the ability of its employees to handle new technologies. New recruits receive introductory training (classes and OJT) during their first and second years of employment, and are required to continue participating in training either at PT. PLN's education and training division or at external organizations on the basis of training needs surveys. The

training covers a broad spectrum and includes management, accounting, bid management, engineering, PC skills and self-development components.

## (2) Operation & Maintenance System

Since the project was completed in 1997, PT. PLN has undergone restructuring and the position of the Dayeuhkolot Repair Workshop, the organization targeted for assistance, has changed: in 1997 it was brought under PT. PLN Workshop Service Business Unit management, and then, in 2001 it became the Citarum<sup>2</sup> Production Unit (Unit Produksi Citarum) of the PT. PLN Service and Production Business Unit. The PT. PLN Service and Production Business Unit provides production, construction and repair services of parts for electric power facilities and owns four production units and two sub-production units in Java (see Figure 7); the aim is to convert this business unit into an independent profit-making center that also provides services to companies outside the PT. PLN organization. Since the Asian financial crisis of 1997, the executing agency has been ushering in various methods to improve its organizational efficiency, including streamlining, decentralization and commercial management practices, and the conversion of the Dayeuhkolot Workshop to a PT. PLN Service and Production Business Unit represents part of these efforts. It is suggested that the utilization of the equipment and machinery that was procured for this project has provided physical support to the executing agency's efforts to modernize (create a profitable center).

The Citarum Production Unit is the largest of the PT. PLN Service and Production Business Unit's production units and its service area covers the entire country. Moreover, product diversification means that it now not only handles hydropower generating equipment, but also the production of transmission equipment (parts) and repairs to thermal power generating equipment (parts). The Citarum Production Unit has a workforce of 101 employees and comprises four departments, namely: sales, engineering, production and general affairs. Responsibility for the O&M of project equipment and machinery lies with this production unit.

As the above demonstrates, although the position of the workshop has changed within PT. PLN this has had no notable effect on the O&M system.

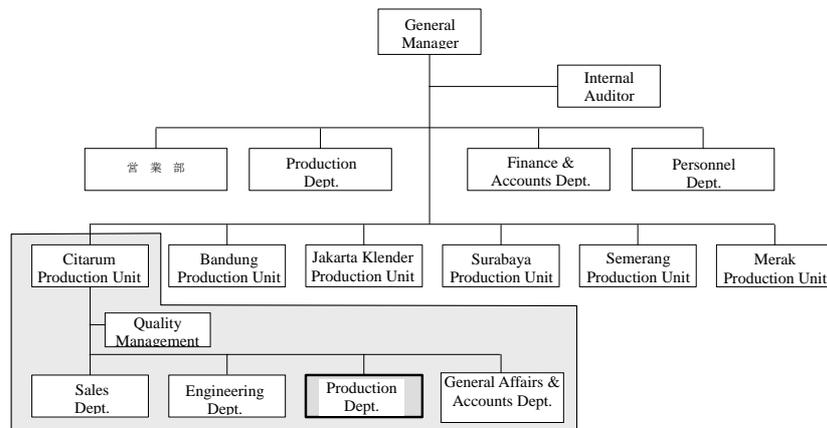
Fig 5: Current Citarum Production Unit



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<sup>2</sup> Named after the river that flows into the Java Sea and which provides the city of Bandung (West Java Province) with water.

Figure 6: Organizational Chart of PT. PLN's Service and Production Business Unit



Source: PT. PLN

### (3) Financial Status

When this project was implemented, the Dayeuhkolot Repair Workshop played only a supporting role in the West and Central Java Production and Generation Business Unit, the parts repair arm of the executing agency, but the deregulation of the power sector by the Indonesian government, as stated above, has been accompanied by ongoing efforts are to transform the workshop into an independent profit-making center that accepts consignments from clients outside the PT. PLN organization. Thanks to active sales activities under a corporate goal of providing “customer satisfaction”, since its establishment, the PT. PLN Service and Production Business Unit has posted steady increases in revenues from 10.67 billion rupiah in 1998 to 64.14 billion rupiah<sup>3</sup> (see Table 1).

<sup>3</sup> In 2002, turnover at the Citarum Production Unit was 15.57 billion rupiah, accounting for 24.3% of total PLN Service and Production Business Unit earnings.

Table 1: Profit & Loss Statements for PT. PLN Service & Production (1998-2003) (Unit: million Rp)

	1998	1999	2000	2001	2002	2003 (planned)
<b>Operating income</b>	<b>10,667</b>	<b>17,241</b>	<b>39,251</b>	<b>53,311</b>	<b>64,144</b>	<b>104,290</b>
Internal sales	9,742	14,100	37,938	47,666	57,192	99,076
External sales	925	3,140	1,313	5,645	6,952	5,214
<b>Operating costs</b>	<b>26,347</b>	<b>31,489</b>	<b>53,262</b>	<b>68,581</b>	<b>92,084</b>	<b>110,468</b>
Non-personnel expenses	7,486	12,492	30,167	40,651	48,081	67,213
O&M expenses	2,582	1,875	2,648	3,348	3,372	3,592
Personnel expenses	8,720	9,977	14,858	18,029	21,129	25,098
Depreciation allowance	4,877	4,237	1,799	1,450	12,437	9,812
Other	2,681	2,907	3,791	5,103	7,064	4,753
<b>Operating profits</b>	<b>(15,680)</b>	<b>(14,248)</b>	<b>(14,011)</b>	<b>(15,270)</b>	<b>(27,940)</b>	<b>(6,178)</b>
Non-operating profit & loss	1,248	(442)	(279)	(381)	(1,429)	(1,682)
<b>Ordinary profits</b>	<b>(14,432)</b>	<b>(14,690)</b>	<b>(14,290)</b>	<b>(15,651)</b>	<b>(29,369)</b>	<b>(7,860)</b>
Taxes	0	0	0	0	0	0
<b>Current term profits</b>	<b>(14,432)</b>	<b>(14,690)</b>	<b>(14,290)</b>	<b>(15,651)</b>	<b>(29,369)</b>	<b>(7,860)</b>

Source: PT. PLN

At the same time, it continues to post operating profit and current term profit losses and there are concerns that this will adversely affect on the O&M of the equipment and machinery that was procured under this project. It has been confirmed that increases in personnel expenses (bonuses / severance payments) and the pensions paid to retired employees constitute the principal reason underpinning PT. PLN Service and Production Business Unit's inability to affect a profit turnaround, but it is planning to move back into the black in 2004 by implementing early retirement programs and other similar measures. Added to which, there are plans to spin off profitable departments in 2004, with these to make the transition from internal PT. PLN business units to independent and highly profitable subsidiaries. Foreign corporations have already put up investment and there is also evidence of business tie-up activity, which bodes well for the future development of this business.

## 2.5.2 Operation & Maintenance

Almost ten years have elapsed since the machinery and equipment was procured for this project, but most key pieces are still in operation and the O&M status appears favorable. O&M activities include routine maintenance work, plus periodic and corrective maintenance, which is carried out on the basis of the various equipment manuals provided. According to PT. PLN, there are no major problems with maintenance management at this time.

### **3. Feedback**

#### **3.1 Lessons Learned**

Nothing.

#### **3.2 Recommendations**

Nothing.

### Comparison of Original & Actual Scope

Item	Planned	Actual
(1) Outputs		
1. Machinery / equipment procurement		
1) Hydropower equipment: heavy machinery	17 units	As planned
2) Hydropower equipment: light machinery	45 units	As planned
3) Thermal power equipment	14 units	As planned
4) Other (testing equipment, etc.)	13 units	As planned
5) Transportation equipment	11 units	14 units
2. Construction / rehabilitation of repair workshop		
1) Construction		
a) Assembly workshop	570m <sup>2</sup>	As planned
b) Light machinery workshop	700m <sup>2</sup>	As planned
c) Fuel depot	900m <sup>2</sup>	570m <sup>2</sup>
d) New road	400m <sup>2</sup>	As planned
2) Rehabilitation		
a) Heavy machinery workshop	300m <sup>2</sup>	810m <sup>2</sup>
b) Midsize machinery workshop	750m <sup>2</sup>	As planned
c) Approach road	2,000m <sup>2</sup>	As planned
d) Workshop entrance	310m <sup>2</sup>	As planned
e) Marshland reclamation	3,300m <sup>2</sup>	As planned
3. Training / operational guidance		
1) Overseas training	Total: 60M/M	As planned
a) Production / quality management	4 people	As planned
b) Hydraulic turbine parts repair scheme design	4 people	As planned
c) Assembly / testing skills	2 people	As planned
d) Heavy machinery processing skills	2 people	As planned
2) Operational guidance	Total: 12M/M	As planned
a) Production / quality management	2 people	As planned
b) Hydraulic turbine parts repairs	2 people	As planned
4. Consulting services	Total: 34.5M/M (Foreign consultant: 9.5M/M) (Local consultant: 25M/M)	Total: 56.5M/M (Foreign consultant: 19.5M/M) (Local consultant: 37M/M)
(2) Project period		
1. L/A conclusion	Oct. 1989	Dec. 1989
2. Consultant selection	Jun. 1989 – Mar. 1990	Apr. 1990 – May 1990
3. Tenders / contracts	Apr. 1990 – Feb. 1991	Apr. 1992 – Feb. 1993
4. Machinery procurement	Apr. 1991 – Jan. 1992	Mar. 1993 – Jun. 1994
5. Civil works	Dec. 1990 – Feb. 1992	May 1992 – Dec. 1993
6. Machine installation	Mar. 1992 – Apr. 1992	Mar. 1994 – Jun. 1994
7. Training / operational guidance	Jul. 1991 – Jul. 1992	Dec. 1993 – Aug. 1994

(3) Project costs		
Foreign currency	698 million yen	N.A.
Local currency	235 million yen	N.A.
	(3,216 million rupiah)	(N.A.)
Total	933 million yen	N.A.
ODA loan portion	793 million yen	668 million yen
Exchange rate	1Rp = 0.073 yen (as of April 1989)	N.A. N.A.

## **Third Party Evaluator's Opinion on The Renovation of Dayeuhkolot Workshop Project**

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### **Relevance**

This project is a small project intended in general to help PT PLN – state electricity company – to improve its own operational efficiency. As stated in the evaluation report, the main objective of this assistance is meant to improve to quality of the the Dayeuhkolot Repairworkshop. In addition by improving the quality, this project will allow the workshop to utilize its capacity to improve financial condition such that this initiative will be able to shift this workshop from a cost center to profit center for PT PLN as a whole. However this activity is a very small part of supporting activity within PT PLN so its impact to Indonesia's development objective – even to PT PLN itself – is negligible. However as part of ensuring the realibility of PLN supply, this project can be considered as quite relevant.

### **Impact**

As reported in the evaluation report, the impact on non financial aspect has been achieved. However that conclusion is still questionable since many parameters that used in the evaluation sheet are either too broad or have a little correlation between the effectiveness and efficiency of that repair workshop and the realibility of electricity supply in Indonesia. However I agree this project has achived its objective to improve the repair quality of Dayahkeolot project has reported in the evaluation sheets.

While so far for financial impact of this assistance is not satisfactory. This Dayah Keulot wokshop up to 2003 was not able to cover its cost which was supposed to be break even in 2003.<sup>1</sup>

There are at least two key reforms needed in order to make this workshop is sustainable. First, PLN should reorganize and restructure its whole supporting service organization to avoid organizational duplication and to create synergy among supporting organizations within PLN. Until recently there are similar organizations within PT PLN (both as a business unit or subsidiary) which compete each other to get orders from PLN. Competition among similar organization on the one hand will give a pressure for better services and prices but on the other hand would not allow one of those organization including Dayahkeulot workshop to achieve its minimal economies of scale. Second, PLN needs also to upgrade the workshop manpower as stated in the evaluation report, the average age workshop's workers is 48 in which not fit with the market demand. This upgrading process requires both retrenchment program for the some current employees and new recruitment of young talents in labor market. In conjunction with the organization restructuring, PLN should also change the salary scheme at this workshop which link to the similar organization in the market. Relying on the PLN salary scheme will not make this workshop is competitive. Human Resources restructuring is important not only to improve its capacity and competitiveness but also to allow this workshop to seek orders from the non PLN market to meet at least its capacity utilization. For the latter, otherwise, this workshop will continue to be a cost center for the PLN in contrast to one of the main objective of this project.

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<sup>1</sup> Informal report providing to Board of Commisioner of PT PLN where I served until February 2004