

Telephone Outside Plant Maintenance Center Project

Report Date: October 2002

Field Survey: July 2001

1. Project Profile and Japan's ODA loan



Project Site



OPMC Building



Storage



Maintenance Vehicle

1.1 Background

Telephone density in Indonesia, was 0.47 sets/100 persons as of December 1988, which was much lower than in other ASEAN countries. Also, more than 40% of the 820,000 telephone subscribers in Indonesia were concentrated in Jakarta. Delays in construction of subscriber lines were thought to be the main cause of this concentration.

The Fifth Five-Year Development Program in the government's Telecommunications Development Plan aimed to stabilize and expand the digital telephone network, and to stabilize telephone service quality. The following was planned:

- 1) Increase of the number of subscriber lines by extending telephone exchanges.
- 2) Expansion of telecommunication service by installing more public telephones.
- 3) Expansion of telecommunication service to local cities.
- 4) Improvement of productivity and efficiency of the state-owned telecommunications company.

The World Bank decided to fund this program, mainly to install subscriber lines. As such, the number of subscriber lines was expected to increase drastically. Hence, a maintenance system for subscriber lines and surrounding facilities was urgently needed in order to sustain the projected increase.

1.2 Objectives

To improve the reliability of telecommunications service and boost the efficiency of maintenance for an increasing number of subscriber lines, by constructing twelve (12) Outside Plant Maintenance Centers (OPMC) around the country.

1.3 Project Scope

The project scope is as follows.

1. Construction of OPMCs (Total of 12 locations: Jakarta (5 locations), Surabaya (2 locations), Medan (1 location), Ujung Pandang (1 location), Palembang (1 location), Denpasar (1 location), and Semarang (1 location).)
2. Procurement and installation of facilities (measuring instruments (20 items), working tools (42 items), communication system equipments (facsimile, radio, etc. (4 items), vehicles (7 items), office equipments (computer, copy machine, etc. (37 items), and others (software (1 item).)
3. Consulting services (foreign 156 M/M, and local 541 M/M)

1.4 Borrower/Executing Agency

The Government of the Republic of Indonesia / PT. Telekomunikasi Indonesia (TELKOM) (the former Perusahaan Umum Telekomunikasi (PERUMTEL))

1.5 Outline of Loan Agreement

Loan Amount	6,537 million yen
Loan Disbursed Amount	5,169 million yen
Date of Exchange of Notes	December 1990
Date of Loan Agreement	December 1990
Teams and Conditions	
Interest Rate	2.5 %
Repayment Period (Grace Period)	30 years (10 years)
Procurement	General Untied (Partially Untied for Consulting Service)
Final Disbursement Date	December 1995

2. Results and Evaluation

2.1 Relevance

The objective of the project was to improve the reliability of telecommunication service and boost the efficiency of maintenance for the increasing number of subscriber lines by constructing twelve (12) Outside Plant Maintenance Centers (OPMC) in Indonesia. This was consistent with the main purposes of the Fifth Five-Year Development Program in the Telecommunications Development Plan, which were the stabilization and expansion of the digital telephone network, and the stabilization of telephone service quality. In general, the objectives of the project were attained, and these achievements continue to be maintained, even at present, with continued demand for the expansion and quality maintenance of telephone service. Also, this project has been consistent with the Junction Network for Expanded Jakarta Multi-Exchange (Metropolitan Jakarta) Area Project, implemented during the same period, whose aim was to upgrade the quality of the telecommunications network in Jakarta Metropolitan Area.

2.2 Efficiency

2.2.1 Project Scope

Construction of 3 new OPMCs, in Jakarta-Ciputat, Bekasi, and Tangerang, was added to the project, and consequently, procurement, installation of facilities and consulting services for the new OPMCs were added to cover the change in project scope. Given that the demand for telephone service was increasing very rapidly in those 3 regions, it is concluded that the addition of these works was necessary and reasonable to realize efficient maintenance operations.

2.2.2 Implementation Schedule

The project was scheduled to finish in April 1993, but it was completed, significantly behind schedule, in December 1996. The principal reason for the delay was the additional construction of 3 new OPMCs.

2.2.3 Project Cost

The project cost in foreign currency ran approximately 179 million yen under budget; the planned project cost was 2,117 million yen, and the actual project cost was 1,938 million yen. International bidding for acquisition of equipment was the main reason that the cost fell below budget; the bidding stimulated competition among suppliers and lowered prices more than expected. As the local currency portion, actual cost rose to 71,160 million rupiah, 1,502 million rupiah more than the planned budget (69,658 million rupiah). The delay in construction of the OPMC building was the cause. However, even under such conditions, the actual total project cost was only 5,496 million yen, much lower than the 7,690 million yen budgeted. The depreciation of the local currency against the yen helped to reduce the total cost; the actual cost in local currency was only 3,558 million yen when converted to yen.

Thus, in spite of the delay in the implementation schedule, the project cost was less than the planned loan amount. No particular problem was found during the survey.

2.3 Effectiveness

2.3.1 Fault Ratio and Repair Efficiency

Figures 1 and 2 show, respectively, the monthly Fault Ratio and the figures for Repair Efficiency which describes the percentage of repairs completed within 3 days, at OPMC in Makassar (Ujung Pandang), one example of the 15 OPMCs established in the project. (Data for other OPMCs were not available.) The records indicate that figures are improving, and that the OPMCs are contributing to a decrease in downtime and to faster recovery from faults. Establishing or reinforcing existing maintenance systems and upgrading the quality of telecommunication facilities have contributed to the improvements. The project, which has helped to improve efficiency, increase the capacity of daily maintenance works and maintenance equipment, raise the productivity of staff and upgrade both the technical knowledge and skills of the staff, has significantly contributed to establishing a better maintenance system.

Moreover, a decrease in the fault ratio means the reliability of telecommunication service has improved and the life of the equipment outside plants has been extended¹. It can be said that the construction of OPMCs helped fulfill such project objectives as “decrease of faults”, “quick restoration from faults”, “extension of life span of equipment outside plants” and “improvement of reliability of telecommunication service”.

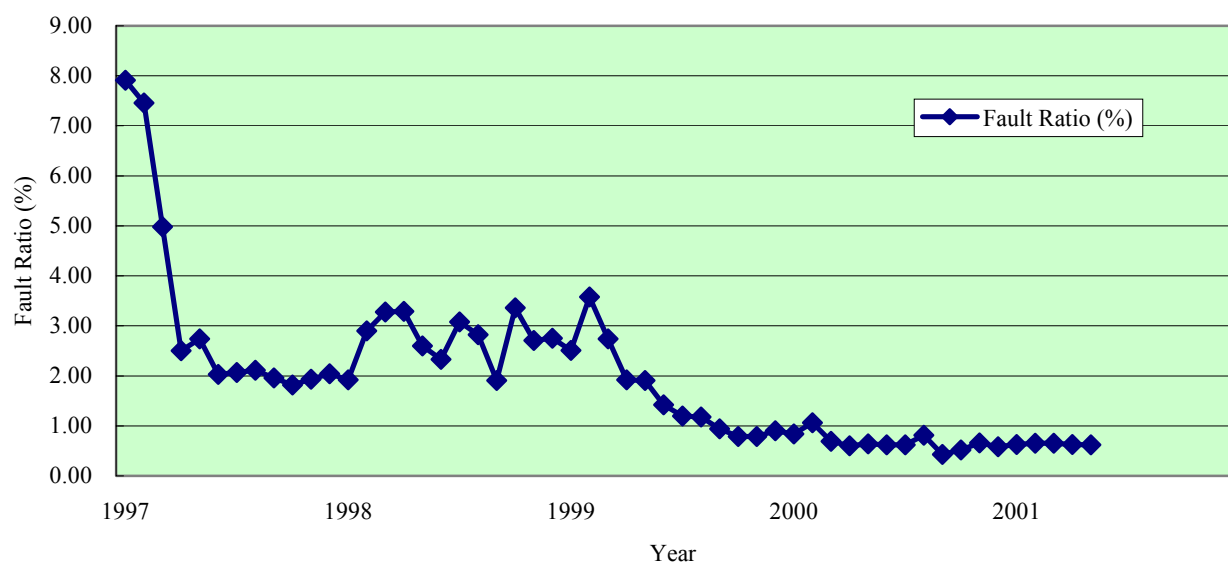


Figure 1. Fault Ratio by month (Source: OPMC in Makassar)

¹ “Decrease of faults = decrease of fault ratio (percentage of faults occurred out of total calls in a given period of time)”. Also, “reciprocal number of fault ratio = mean time between failure (average life span): MTBF”. Therefore, “decrease in fault ratio” is “extension of life span”.

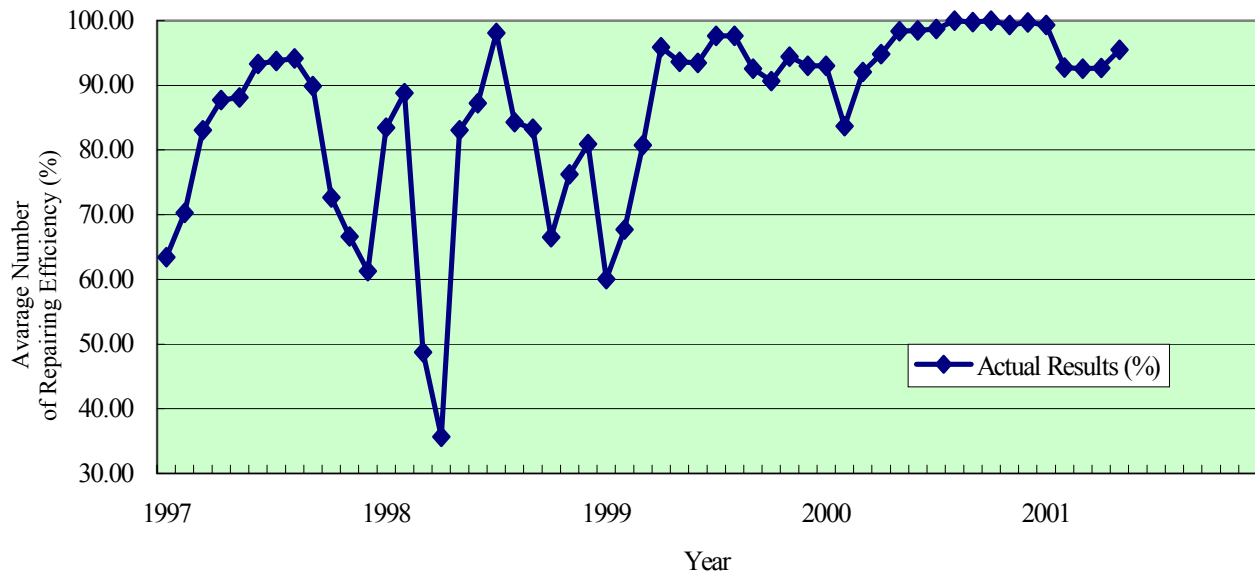


Figure 2. Repair Efficiency (Source: OPMC in Makassar)

2.3.2 Internal Rate of Return

An FIRR of 13.6% was calculated at the time of appraisal, based on estimates of the information stated below. For calculation of the actual FIRR, the implementation executing agency was asked to collect actual data. However, as not all data were available, re-calculation of FIRR was not possible.

Assumptions for Calculation of FIRR at the Time of Appraisal

- (1) Revenue: Calculated from difference between with/without OPMCs on the following items
 - 1) Number of subscribers
 - 2) Fault ratio per month per 100 telephone sets
 - 3) Average number of repairing efficiency per day per employee
 - 4) Average useless period
 - 5) Salary per month per employee per month
 - 6) Average income per day per subscriber
 - 7) Number of maintenance employees
 - 8) Annual salary
 - 9) Income loss by useless period
- (2) Expense
 - 1) Capital expenditure
 - 2) O&M expenses
- (3) Project life

2.4 Impact

2.4.1 Impact on Telephone Services

As the data for fault ratios and average repair efficiency at Makassar OPMC show, this project has contributed to a decrease in the fault ratio and to an increase in the average repair efficiency. This proves that the construction of Outside Plant Maintenance Centers reinforced the maintenance system for outside plants. It can be concluded that this project helped cope with the increasing demand for telephone service and helped improve the reliability of telephone service for subscribers. Greater efficiency within the maintenance system was realized by centralizing maintenance operations for subscriber lines at the OPMCs.

2.4.2 Impact on Society

As a result of the decrease of telecommunication network faults, residents of the project areas now have better access to social services. This has helped improve the socio-economic situation of the local people.

2.4.3 Impact on Natural Environment

According to TELKOM, there were no major negative or positive impacts on either the natural environment or local residents caused by implementation of the project.

2.5 Sustainability

2.5.1 Operation and Maintenance

At the beginning of the project, operation and maintenance were conducted by the national telephone company Perusahaan Umum Telekomunikasi (PERMUTEL). However, this institution was privatized in September 1991, becoming PT. Telekomunikasi Indonesia (TELKOM) (66.2% of shares are owned by the government). It is the actual operation and maintenance agency for this project. Division II, one of the seven Regional Divisions in TELKOM, is in charge of supervising the Jakarta Metropolitan Area. In Divisions I, III, IV, VI, and VII, excluding Jakarta and East Java (Surabaya included), TELKOM has applied, since 1996, the so-called KSO (Kerja Sama Operasi) method, which allows foreign carriers to help expand, operate and maintain telecommunication facilities, with their own capital and technical skills, in an effort to promote the rapid improvement of telecommunication service.

OPMCs are under regional telecommunication stations (KANDATEL) supervised by the 7 Regional Divisions of TELKOM. Each KANDATEL has obtained ISO9002 certification, which shows that the quality of their customer service is satisfactory.

TELKOM had a total staff of 37,705 at the end of year 2000; the number of telephone lines per staff member has increased from 160.1 in 1999 to 176.7 in 2000. No particular problems were found in the operation and maintenance system during this survey.

2.5.2 Technical Capacity

TELKOM's Training Division provides training courses at 5 regional training centers and 1 central training center to OPMC staff. The survey found no problems with the technical capacity and skills of the staff.

2.5.3 Condition of Equipment

Some small problems were found when assessing the condition of the equipment installed; for example, some vehicles have been rendered inoperable because the needed spare parts are hard to obtain. However, the general condition of the equipment is good, since TELKOM has acquired new equipment with its own funds. Most of the measuring instruments, working tools and other equipment that was supplied in this project are in good condition.

2.5.4 Financial Status

Financial ratios calculated historically from the consolidated financial statements of TELKOM are shown in Table 2.

The decline of revenue from 1996 to 1998, caused mainly by the Asian economic crisis, has lowered the profitability of those years. However, since 1998 returns and turnover rates have been going up and financial conditions have been improving. The financial soundness of TELKOM is considered good under the present, favorable circumstances.

In general, the financial status of TELKOM is good and its business operations are running well. Consequently, there are no particular financial concerns about the sustainability of the project.

Table 2. Data on Consolidated Balance Sheets and Financial Ratios of TELKOM

	1993	1994	1995	1996	1997	1998	1999
Return on Equity (ROE)	14.1%	19.1%	15.2%	18.5%	12.5%	11.6%	19.1%
Return on Assets (ROA)	9.4%	10.9%	9.3%	12.3%	8.6%	6.5%	11.9%
Return (Current Income) on Stockholders' Equity	22.4%	27.5%	21.6%	25.5%	17.5%	14.1%	26.1%
Profit (Current Income) on Net Sales	26.0%	28.3%	25.2%	40.8%	27.5%	21.6%	38.0%
Turnover Rate of Total Assets	0.36	0.39	0.37	0.30	0.31	0.30	0.31
Turnover Rate of Stockholders' Equity	0.86	0.97	0.86	0.62	0.64	0.66	0.69
Ratio of Net Worth	41.3%	38.5%	46.5%	49.9%	48.3%	44.3%	46.4%
Ratio of Fixed Assets	203.2%	222.3%	170.1%	174.4%	183.9%	190.9%	161.3%
Ratio of Fixed Assets to Long-Term Capital	101.6%	100.2%	90.2%	98.8%	100.7%	95.1%	86.0%
Current Ratio	92.2%	98.6%	168.7%	109.0%	94.7%	139.1%	194.9%

Source: Annual Report 1996-2000, TELKOM

3. Lessons Learned

None

4. Recommendations

None

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Project Scope		
a) Construction of OPMC	- Medan (2,500 m²) - Palembang (1,500 m²) - Jakarta-Barat (2,500 m²) - Jakarta-Pusat (2,500 m²) - Jakarta-Kota/Utara (2,500 m²) - Jakarta-Selatan (2,500 m²) - Jakarta-Timur (2,500 m²) - Ujung Pandang (1,500 m²) - Semarang (2,000 m²) - Surabaya-Selatan (2,500 m²) - Surabaya-Utara (2,000 m²) - Denpasar (1,500 m²)	- Medan (2,824 m²) - Palembang (1,750 m²) - Jakarta-Barat (3,200 m²) - Jakarta-Pusat (3,200 m²) - Jakarta-Kota/Utara (3,200 m²) - Jakarta-Selatan (3,200 m²) - Jakarta-Timur (3,200 m²) - Ujung Pandang (1,750 m²) - Semarang (2,250 m²) - Surabaya-Selatan (2,824 m²) - Surabaya-Utara (2,324 m²) - Denpasar (1,750 m²) Additional - <u>Jakarta-Ciputat (1,457 m²)</u> - <u>Bekasi (1,457 m²)</u> - <u>Tangerang (729 m²)</u>
b) Procurement and Installation of Facilities	- Measuring Instruments (20 items) - Working Tools (42 items) - Communication System Equipment (4 items) - Vehicles (7 items) - Business Machine (1 item) - Office Equipments (37 items)	- Measuring Instruments (20 items) <u>3 additional locations</u> - As planned - As planned - Vehicles (7 items) <u>8 additional locations</u> - As planned - Office Equipments (37 items) <u>3 additional locations</u>
c) Consulting Services		
- Foreign	156 M/M	174.26 M/M
- Local	541 M/M	586.80 M/M
(2) Implementation Schedule		
a) L/A	September 1990	December 1990
b) Selection of Consultant	April 1990 to February 1991	September 1990 to June 1991
c) Consulting Service	July 1991 to August 1992	August 1991 to June 1994
d) Tender Process for Building Construction	September 1990 to May 1991	n.a. to February 1991
e) Building Construction Work	July 1991 to August 1992	October 1991 to July 1996
f) Tender Process for Equipment Installation	April 1991 to February 1992	n.a. to December 1991
g) Equipment Installation	April 1992 to April 1993	April 1993 to December 1996
(3) Project Cost		
Foreign currency	2,117 million yen	1,938 million yen
Local currency	69,658 million Rp.	71,160 million Rp.
(in Yen)	(5,573 million yen)	(3,558 million yen)
Total	7,690 million yen	5,496 million yen
ODA Loan Portion	6,537 million yen	5,169 million yen
Exchange Rate	1 Rp. = 0.08 yen	1 Rp. = 0.05 yen
	(As of March 1990)	(As of December 1995)

Independent Evaluator's Opinion on Telephone Outside Plant Management Center

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Relevance

1. The project is relevant to the Indonesia's telecommunication-sector development program as stated in The 5th Five-year Development Program in the Telecommunications Development Plan. Although the project's impact is more on enhancing the service quality rather than expanding the capacity of telephone lines, both objectives are already identified in the Plan as a basic requirement to establish a good and reliable telecommunication system in Indonesia.
2. The target areas of the project were main cities in each region, where the telephone traffics were abundant and the customer's expectation was high. The quality of telecommunication service was critical and therefore, a good and reliable service quality is demanded. On the other hand, the cities above were central-locus of economic activities in each region, providing more logical reasons for the project to be economically feasible.
3. The scope of the project was expanded with three more sites and associated facilities. The expansion, as mentioned in the report, was due to a rapid increasing demand in those additional areas. However, the project could still manage its efficiency by keeping the cost within budget amid the extension of the scope of works and the significantly delay on construction works.

Impact

1. As expected, the project results in positive impacts on targeted areas on sectors as follow: improving fault-ratio and overall telephone service quality, achieving a greater efficiency in centralizing outside plant operation and maintenance activities, and coping the pace with the increasing telephone demand and customer expectation. There was also a positive sign from the survey that technical staff well adapted to the new system. The report didn't provide any negative impacts of the project, although evaluator consider there is a potential problem in the future.
2. The project provides indirect positive impact on allowing the people to have better access to social service. The project doesn't have any significant impact on natural environment.
3. The sustainability of the project will depend on the stakeholders' intention to provide a good and reliable telecommunication system in Indonesia. The report shows that TELKOM has capabilities to keep the positive impacts' of the project sustainable over its lifetime. The sustainable is

enhanced considering the project areas are the most developed cities in each regional area, so that the project would achieve its economic viability.

4. Overall, Evaluator agrees that the project has accomplished its intended goals. The project provides positive impacts to contribute significantly more to the objectives and sustain longer than its negative impacts (if any).

