

Philippines

Metro Manila Rail Commuter Maintenance Depot Construction Project

Report date: March 2001

Field survey: September 2000

1. Project Profile and Japan's ODA Loan



Site map: Location of the rolling stock maintenance depot (Caloocan)



Philippine National Railways' rolling stock maintenance depot

1.1. Background

Population concentration in metropolitan Manila was generating chronic congestion on roads and had reduced the function of transportation. Accordingly, in 1972 Philippine National Railways (PNR) commenced a commuter service using diesel-electric locomotives on the lines running south to north through Manila. However, shortages of inspection and maintenance equipment and spare parts, falling technical skills and so on, meant that the maintenance condition of rolling stock was poor and the performance of the commuter lines was falling far short of planned levels.

1.2. Objectives

The objective of this project was to construct a rolling stock maintenance depot for 90 diesel-electric locomotives in the Food Terminal Institute (FTI) area 18-km south of central Manila, thereby improving the rolling stock maintenance system which was causing services to deteriorate through delays and cancellations, etc.

1.3. Project Scope

The initial scope of the project covered construction of a comprehensive maintenance depot for 90 diesel-electric locomotives on 12-ha premises in the FTI area 18-km south of central Manila, including the laying of 39 tracks, construction of 18 buildings (total area: 13,751m²) including an inspection shed workshop, the provision of one set of inspection and maintenance equipment, power generation facilities, signaling devices and communication equipment. The ODA loan portion was planned to cover

depot construction, the provision of spare parts¹ and consulting services (construction supervision and management and technical services to strengthen PNR management and operations).

1.4. Borrower/Executing Agency

The Government of Republic of the Philippines/Philippine National Railways (PNR)

1.5. Outline of Loan Agreement

Loan amount/Loan disbursed amount	¥4,500 million/¥4,496 million
Exchange of notes/Loan agreement	July 1983/September 1983
Terms and conditions	Interest Rate: 3.0%, Repayment period (grace period): 30 years (10 years), General Untied (Partially Untied for Consulting Services)
Final disbursement date	April 1993

2. Results and Evaluation

2.1. Relevance

The Philippine government has been continuously promoting the development of a mass transit system, through such projects as typified by the “Philippine National Railway Commuter Service Project” and the “Revitalization of Main Line South Project ” implemented through funding provided by ODA loans. The facilities at this rolling stock maintenance depot are designed to play a supporting role in this development by maintaining PNR diesel-electric locomotives in serviceable condition and are therefore considered to be relevant.

After the loan agreement (L/A) was signed a request was received from the Philippine government to change the location of the maintenance depot. Having conducted various surveys and confirmed the feasibility of project implementation, approval was given for the change to a site in the Caloocan area, and for rehabilitation of the locomotive and passenger coach at the rolling stock depot and the additional procurement of 10 locomotives. This was based on economic considerations and actual conditions within PNR, and the measures were thus considered relevant.

2.2. Efficiency

At the time of appraisal, the project was scheduled to be completed by February 1986, but was delayed by four years to February 1990. This delay was the result of the political confusion incidental to the change of authority that occurred in the Philippines during the same period and which led to shortages in local currency financing.

Moreover, changes were made to the initial plans meaning that 10 locomotives

¹ Procurement of spare parts for rolling stock was for the first year after project completion only.

(DEL-5000 type) were procured in May 1992. Based on the introduction of these new locomotives, passenger transport volumes (people/kilometer) on Metro Manila commuter line services in 1993 were double the level of the previous year, indicating sweeping improvements. Such can be seen as the result of the procurement of locomotives, the shortage of which was acting as a major hindrance to the operation of Metro Manila commuter lines.

2.3. Effectiveness

(2.3.1.) Status of Inspections/Maintenance (I/M) of Diesel-electric Locomotives

Inspections and maintenance of diesel-electric locomotives within PNR are divided into a number of categories² including overhaul³, Class A (virtually identical to overhauls), and Class B (semi-overhaul). At the time of appraisal, the number of days required for inspections and maintenance in the overhaul, Class A and Class B categories was 44 days, 45 days and 21 days, respectively. As shown in Table 1, although it was not possible to attain the initially targeted reductions, the reductions in number of days currently required to conduct overhauls and Class A inspections and maintenance (I/M) can be evaluated as the result of the introduction of repair machinery and equipment under this project.

Table 1 Number of Days Required for Inspections on a Category Basis

I/M Category	Content	No. of days required for I/M		
		At appraisal	Planned	Actual (current estimates)
Overhaul	Overhaul	44	25	35
Class A	Locomotives are overhauled, but repair work is minor as compared to a full overhaul.	45	20	30
Class B	Locomotives are not overhauled; half the volume of work as conducted for Class A.	21	15	20

Source: Figures at appraisal are taken from appraisal data, the remainder from interviews with PNR.

Table 2 shows the records for the numbers of diesel-electric locomotives on which inspection and maintenance work has been executed. In 2000, 3 locomotives underwent overhaul-type inspections/maintenance, minor repairs were conducted on 8 locomotives, and 13 locomotives were awaiting repair, revealing a decrease on the quantity of rolling stock being inspected/maintained from the previous year and a

² The inspection and maintenance work carried out for the overhauls, Class A and Class B categories are known as scheduled maintenance and are timetabled for execution on commuter rolling stock at respective intervals of 6 years, 2 years and 1 year. However, due to the shortages of spare parts mentioned below, the scheduled maintenance timetable is not being strictly adhered to.

³ Overhauls are the dismantling of locomotives for the purpose of inspection and repair.

contrasting increase in the number of locomotives waiting to be repaired⁴. The main reason for this decrease is shortages in spare parts, etc.

Table 2 Record of numbers of diesel-electric locomotives inspected/repaired

Unit: locomotives

	1995	1996	1997	1998	1999	2000
Overhaul / Class A / Class B / Rehabilitation	11	14	6	18	13	3
Minor repairs including Class U / Class D	13	8	16	12	1	8
Waiting to be repaired	N.A.	N.A.	N.A.	N.A.	9	13

Source: PNR data

Note:

- 1) Inspection and repairs to diesel-electric locomotives were conducted at the maintenance depot constructed using the Japan ODA loan, at the Caloocan rolling stock depot for passenger coaches, which was also rehabilitated using the Japan ODA loan, whilst minor repairs were conducted at the Tayuman rolling stock dept for commuter coaches. However, inspection and repairs to diesel-electric commuter coaches were predominantly executed at the maintenance depot newly constructed using the Japan ODA loan.
- 2) The figures for numbers of coaches waiting to be repaired is the annual average of figures recorded on a weekly basis.

The operating ratios of diesel-electric locomotives are as shown in Table 3. Due to the impact of track rehabilitation work, the operating ratio for 1992 was lower as compared to the planned level, but had increased to a level between 40~50% in 1993. However, although it fluctuated within this range in subsequent years, shortages of spare parts and so on, meant that the results fell consistently short of planned levels.

Table 3 Operating Ratio of Diesel-electric Locomotives

		1992	1993	1994	1995	1996	1997	1998	August 2000
No. of locomotives		80	80	80	80	80	58	58	58
Planned	Operational	40	42	45	43	45	40	40	N.A.
	Operating ratio	50.0%	52.5%	56.3%	53.8%	56.3%	69.0%	69.0%	N.A.
Actual	Operational	25	35	38	36	33	26	29	24
	Operating ratio	31.3%	43.8%	47.5%	45.0%	41.3%	44.8%	50.0%	43.6%

Source: PNR data

Note: In the fourth quarter of fiscal 1997, PNR scrapped 22 of its 80 diesel-electric locomotives because they had become superannuated leaving 58 in service.

⁴ According to PNR weekly records, in the period from August 2000 to the end of the year in particular, there were some 20 locomotives awaiting inspection and repair (confirmed by the field survey conducted in January 2001).

(2.3.2.) Utilization of inspection/maintenance equipment

The usability of some of the inspection/maintenance equipment provided with ODA loan funds is low due to machinery breakdowns. Shortages of spare parts and insufficient training in operation methods are cited as the reasons underpinning this problem.

(2.3.3.) Utilization of locomotives

As of February 2001, five of the 10 DEL-5000 locomotives procured using ODA loan funds were in service, whilst the remaining five were awaiting repairs.

(2.3.4.) Financial Internal Rate of Return (FIRR)

At the time of appraisal it was estimated that this project would produce an FIRR of 10.5% if the differences in passenger earnings (revenue from fares) and the cost of procuring new rolling stock between implementation⁵ and non-implementation were taken as benefits. Recalculation of FIRR has been postponed at this time due to lack of systematic data from the executing agency.

2.4. Impact

Changes in passenger transport volumes (PNR planned/actual levels) on Metro Manila commuter lines are as shown below. The introduction of 10 new locomotives in May 1992 yielded substantial improvements in the passenger transport volumes for 1993 as compared to the previous year. Although numbers declined from 1994 through 1996 due to the impact of civil works conducted for the “Revitalization of Main Line South Project”, the number of passengers increased in and after 1997. There was an especially large drop in the number of passengers in 2000 to 49.06 million people/km, due to shortages of rolling stock. However, various measures to improve this situation were adopted including the introduction of long distance locomotives⁶ for commuter lines in November of the same year.

⁵ It was estimated that the number of locomotives in operation would increase as the result of the construction of the maintenance depot.

⁶ Despite increased operation costs due to the greater horsepower of long distance locomotives compared to the existing locomotives used on commuter lines, the decision to introduce new rolling stock was based on urgent necessity.

Table 4 Passenger Transport Volume on Metro Manila Commuter Lines ^{Note 1)}

Unit: million people/km

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Planned	62.29	66.71	78.9	76.44	52.62	64.33	36.63	41.2	87.72	90.47	101.6
Actual	70.25	59.55	30.42	63.48	69.76	56.83	39.73	43.08	65.82	70.06	49.06

Source: PNR data

Note:

- 1) Passenger transport volumes are for the route between Caloocan and Carmona, which is the area covered by this project, and for the Calamba area.
- 2) Due to the impact of facilities construction being executed for the Japan ODA loan funded "Revitalization of Main Line South Project", passenger transport volumes for 1996 and 1997 are low (planned/actual).
- 3) In the fourth quarter of fiscal 1997, PNR scrapped 22 of its 80 diesel-electric locomotives because they had become superannuated leaving 58 in service.

The problem of disposing of waste oil and scrap could conceivably have an impact on the environment. However, according to the executing agency, saleable scrap is being sold whilst scrap that cannot be sold is being disposed of within factory premises and is not, therefore, having an impact on residents. Moreover, the executing agency reports that since the maintenance depot was constructed within the PNR premises at Caloocan, problems such as the relocation of residents and so on have not arisen.

2.5. Sustainability

PNR liabilities have continuously exceeded its assets since 1995, and the financial situation of the organization has been deteriorating steadily. One of the main reasons for the deficits is the large share of costs occupied by personnel expenses. The Philippine government has also reduced its subsidies to PNR and has requested the organization to slim down its operations. In fiscal 1999, personnel expenses accounted for over 85% of operating costs, and even in terms of the absolute amount, it was not possible to finance these expenses using operating profits. As mentioned above, budgetary shortfalls have led to shortages in spare parts and so on (Table 5 below).

In 1996, PNR had a total of 2,338 employees, but this number dropped steadily in the four years thereafter, and in August 2000 stood at 1,978. As of January 2001, the Rolling Stock Maintenance Department (RSMD), which is responsible for the maintenance of rolling stock, employed 394 people⁷ (21 managers, 38 engineers, 332 skilled workers, and 3 unskilled workers). Of this number, 77 people (against the planned level of 60) are currently employed at the rolling stock maintenance depot that was newly constructed using ODA loan funds, 35 of whom are actually positioned in the department⁸. Since PNR is not hiring new staff, aging is advancing among

⁷ In 1998, plans were laid to reduce the number of employees to 445 by 2000.

⁸ JBIC has learned that the remaining 42 personnel are currently positioned in other departments, a situation that is considered due to the increases in numbers of locomotives awaiting repair as the result of shortages in spare parts.

personnel and many employees are in their forties and fifties. Given the fact that inspection and maintenance operations are not being conducted according to schedule, PNR has responded that it has secured sufficient employees in quantitative terms, however, it indicates qualitative problems, particularly among engineering staff. It is also reported that insufficient training is giving rise to problems in that workers are not proficient in the operating methods of some of the inspection and maintenance equipment installed at the rolling stock maintenance depot. There are concerns about the sustainability of the project in light of the current circumstances within PNR including its deteriorating finances, the aging of personnel and the maintenance of skills levels.

**Table 5 Comparison of RSMD Maintenance and Other Operating Budgets
and Actual Results**

Unit: million Peso

	1997	1998	1999	2000
Budget (approved amount)	53	85	62	50
Spare parts portion	30	30	20	20
Fuel costs portion	21	N.A.	40	28
Actual results	41	47	34	41
Spare parts portion	18	23	8	11
Fuel costs portion	20	N.A.	24	27

Source: PNR data

Note:

- 1) The above costs are the budget/actual results for maintenance and other operations, excluding personnel expenses.
- 2) Fuel costs include the majority of costs for fuel used by other departments as well as for RSMD.

Comparison of Original and Actual Results

Item	Plan	Results
1. Project scope · Inspection and maintenance depot · Spare parts for locomotives · Consulting services	FTI · 6,660 m of track · 18 buildings including the inspection shed workshop · 1 set of inspection and maintenance equipment · Power generation equipment · Signaling devices · Communication equipment, etc. Consulting services · Construction supervision · Management and technical services	· Construction of new building at Caloocan maintenance depot; floor space: 7,000m ² , inspection/maintenance capacity: 8 locomotives · Rehabilitation of locomotive and passenger coaches depot at Caloocan; floor space: 10,200 m ² , inspection/maintenance capacity: 28 locomotives /coaches · 10 locomotives · 1 set of inspection and maintenance equipment, etc. Consulting services
2. Implementation schedule	September 1983 ~ June 1987	ODA loan disbursement period: 1985 ~ 1993
3. Project cost		
Foreign currency	¥4.500 billion	¥4,496 million
Local currency	¥1.033 billion	N/A
Total	¥5.533 billion	N/A
ODA loan portion	¥4.500 billion	¥4,496 million
Exchange rate	P1=¥30	N/A