Philippines

"Revitalization of Main Line South Project"

Project Summary

Borrower	Government of Republic of the Philippines
Executing Agency	Philippine National Railways (PNR)
Exchange of Notes	November 1988
Date of Loan Agreement	May 1989
Final Disbursement Date	September 1996
Loan Amount	¥5,054 million
Loan Disbursed Amount	¥5,037 million (including charge)
Procurement Conditions	General Untied
Loan Conditions	Interest Rate: 2.7% Repayment Period: 30 years (10 years for grace period)

<Reference>

(1) Currency: Philippine Peso (P)

(2) Exchange Rate: (IFS annual average market rate)

Year		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Rate	Peso/US$	20.6	21.1	21.7	24.3	27.5	25.5	27.1	26.4	25.7	26.2
	Yen/US$	144.6	128.1	138.0	144.8	134.7	126.7	111.2	102.2	94.1	108.8
	Yen/Peso	7.0	6.1	6.4	6.0	4.9	5.0	4.1	3.9	3.7	4.2
CPI (1990=100)		71.8	78.1	87.6	100.0	118.7	129.3	139.1	151.7	164.0	177.8

(3) Rate at the time of appraisal: October 1988

Peso/US$: US$1 = P21.0

Yen/US$: US$1 = ¥133

Yen/Peso: P1 = ¥6.3

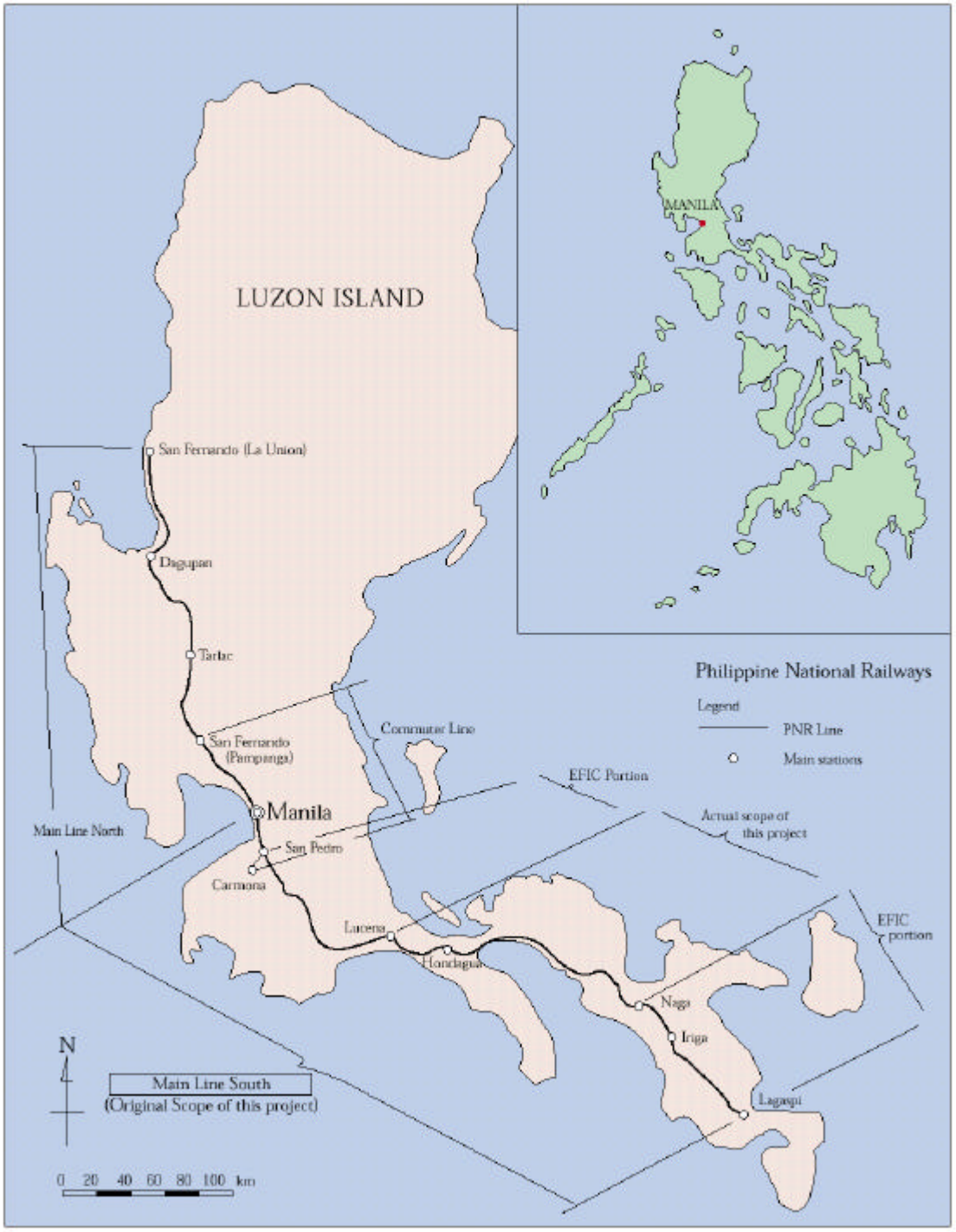
(4) Fiscal Year: January ~ December

(5) Abbreviations:

ADB: Asian Development Bank
DOTC: Department of Transport and Communications
EFIC: Export Finance and Insurance Corporation
NEDA: National Economic Development Authority
PNR: Philippine National Railways

1. Project Summary and Comparison of Original Plan and Actual

1.1 Project Location



1.2 Project Summary and ODA Loan Portion

This "Revitalization of the Main Line South Project" covers 443km along the national railway line in the southern part of metro Manila running from San Pedro to Legaspi in the southern tip of Luzon Island and involves the procurement and rehabilitation of tracks, bridges and rolling stocks. Operating conditions, convenience and comfort have all worsened due to the deterioration of facilities along this line. The objective of this project is to improve these conditions while providing users with a safe and inexpensive means of mass transit.

The initial scope of this project covered many areas including track maintenance, bridge rehabilitation, procurement of diesel-electric locomotives, procurement and rehabilitation of passenger coaches, rehabilitation of station facilities, procurement of communication equipment, installation of signal devices and fences, and the provision of consulting services. The total cost of the project came to ¥6,317 million (¥1,701 million was in local currency). The loan portion of this total cost was ¥5,054 million (¥4,618 million in foreign currency, ¥436 million in local currency).

1.3 Background (at the time of appraisal in 1988)

1.3.1 Positioning of the Main Line South in the Philippines

The Philippine National Railways (hereinafter referred to as PNR) consists of the North Line running north of Manila, the Main Line South running south of Manila and the Metro Manila commuter lines running between these two lines and linking up with the Main Line South (refer to 1.1 Project Location Map. Details on each section, distances and operating conditions are as shown in Table 1). The Main Line South has become a main trunk of the transportation system in the Bicol region (main industry: agriculture and forestry, population: 3.5 million) of the southern section of Luzon Island, while at the same time serving as a central route for the PNR network.

Table 1 PNR Lines and Operating Conditions (as of 1987)

Name of line	Route	Distance	No. of passengers	Profit from passengers	Freight volume	Profit from freight
Unit		km	Person/year	1,000 peso/year	ton/year	1,000 peso/year
Main Line South	Manila ~ Legaspi	474	1,177,763	61,220	89,915	17,356
Commuter line	San Fernando (Pampanga) ~ Manila ~ Carmona (Laguna)	103	2,024,011	5,429	0	0
(Commuter Line South)	Manila ~ Carmona	40				
North Line	San Fernando (La Union) ~ Manila	266	Discontinued railway line due to track deterioration (since 1986)			

1.3.2 Needs for the Project

As mentioned above, the very important Main Line South had fallen into a viscous cycle in which damage to the tracks, deterioration of the rolling stocks and other problems with the physical condition resulted in fewer customers and reduced revenues that produce a shortfall in revenues needed for maintenance. In 1976 the "Philippine National Railways Project" was implemented through funding provided by the Asian Development Bank and the tracks between Manila and Naga where restored. However, sufficient maintenance was not provided as PNR, which directly rehabilitated the line, lacked the necessary technical expertise. In particular, there were noticable damage to railroad ties and ballast. These problems forced trains to reduce their speeds and increased the number of derailments, which hindered operation safety and regularity. It was determined at the time of the appraisal that there was the possibility of the Main Line South being discontinued, similar to the North Line, with operations running only for the area of the Main Line South (Manila to Legaspi) between Manila and Iriga, unless track restoration was performed.

In 1974, 3.5 million passengers used the Main Line South each year. However, due to the above mentioned problems and an improved network of roads, more and more of these passengers began using buses. In 1986 PNR conducted a survey of demand for both the Main Line South and buses. This survey showed that many people would use the Main Line South provided there was an increase in the number of trains, the travelling time was reduced, and a more comfortable ride was provided. Table 2 shows that at the time of the appraisal the Main Line South was the slightly cheaper alternative, but was inferior to buses in terms of the average required time and number of routes. It was forecasted that by reducing the travelling time from 15 to 6 hours and by increasing the number of routes from 2 to 5 through the implementation of this project, potential demand for long-distance rail travel would be met, and the number of passengers upon completion of the project would be 2.5 million. This project was also seen as a very important project in the railway section of the Philippine government's "Midterm Development Plan" (1987-1992). In addition, this project was projected to boost the amount of agricultural products and other products transported and, along with passenger transport, contribute to the economic development of the regions along the railway line.

As part of the "PNR 5-Year Plan" (1988-1992), the revitalization of this line, PNR's largest source of revenue (see Table 1), was expected to greatly improve PNR's financial situation.

Table 2 Competition between Bus and Rail (between Manila and Naga)

	Main Line South	Bus	Main Line South after Project Completion (target values)
Travelling time	15 hours	9 hours	6 hours
Fare (economy)	93.9 Peso	115.5 Peso	—
Fare (with air-conditioning)	140 Peso	147.6 Peso	—
No. of roundtrip routes	2	35	5

Source: Appraisal materials

1.3.3 History

1976	March	Loan Agreement signing on ADB Main Line South Rehabilitation Project (Final disbursement in December 1985)
1987	December	Completion of F/S Report on "Revitalization of Main Line South Project" by Pacific Consultant International (PCI)
1988	July	Official request of the Project as one of the 15th ODA Loan Projects by the Philippine government
1988	October	Government Mission on the 15th ODA Loan
1988	November	JBIC Appraisal Mission
1988	December	Prior Notification on the 15th ODA Loan by the Japanese government. Exchange of Notes
1989	May	Loan Agreement signing
1990	March	Approval of consultant contract
1990	August	Concurrence of P/Q evaluation results (diesel-electric locomotives)
1990	September	Concurrence of P/Q evaluation results for the main construction (railway tracks, civil works)
1991	February	Approval of the evaluation results of bidding for diesel-electric locomotives
1991	March	Approval of contract for diesel-electric locomotives. First bids for the main construction. All bidders exceeded the estimated amount.
1991	August	Approval of modification for procurement contents (project scope)
1991	September	Second bids for the main construction. Bids again exceeded estimated costs, but contract negotiations were started with the lowest bidder.
1992	February	Optional agreement for the Pandrol rail tie fastening equipment
1992	April	Approval of contract for the main construction (excluding Pandrol railway tie fastening equipment)
1993	March	Modification of consultant contracts (modified contracted amounts)
		Executed SAPS with the purpose of providing recommendations for improving PNR management of the Philippine National Railways Commuter Service Projects (I) (II) and the Railcar Maintenance Depot Construction Project.
1994 ~ 1995	February ~ November	Modification of contract for the main construction
1995	November	Damage resulting from Typhoon Rosing
1996	March	Modification of contract for the main construction and modification of contracts for consultants (TOR modification).
		Approval of reimbursement for repairing the Iyam Bridge and 16 passenger coaches damaged by the typhoon.
1996	September	Final disbursement

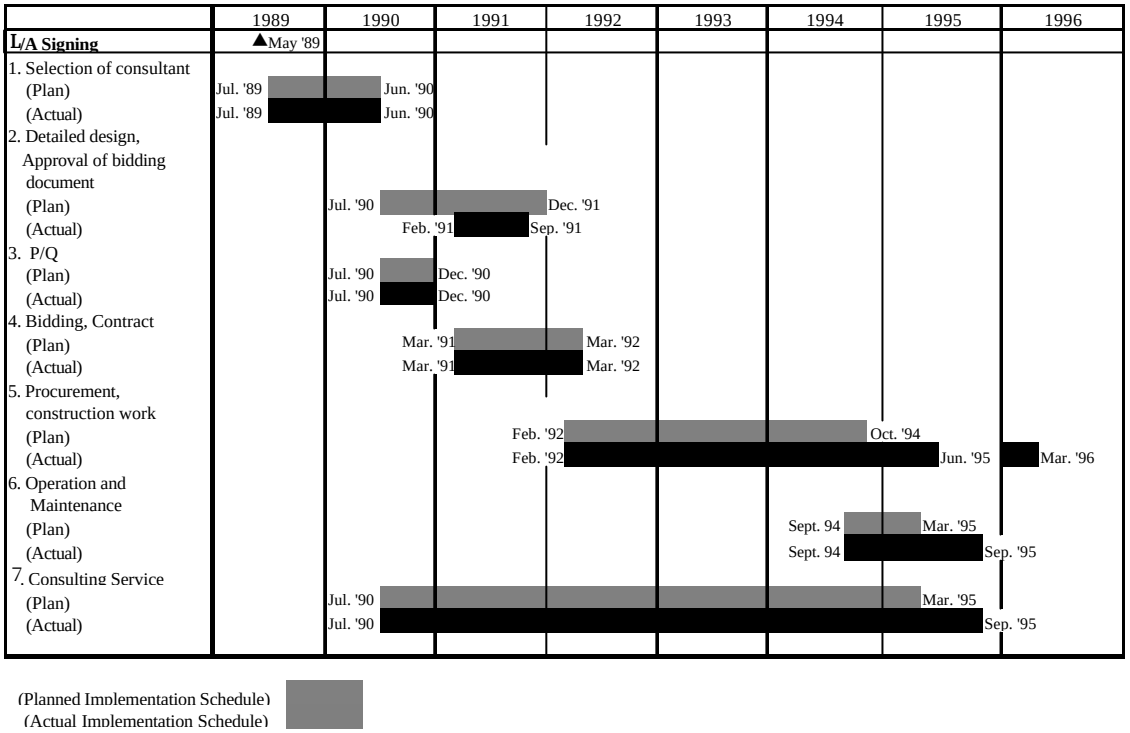
1.4 Comparison of Original Plan and Actual

[1] Project Scope Table 3

Project Scope	Plan	Actual	Difference
1. Rehabilitation of tracks			
Expansion of tracks	San Pedro ~ Legaspi 443km	Lucena ~ Naga 245km	- 198km
Installation of ties	250,000 ties	157,170 ties	- 92,830 ties
Expansion of road width	—	Implemented	Additional construction
Workover of drainage canal	—	Implemented	Additional construction
2. Rehabilitation of bridges (strengthening of upper and lower part of structure)	10	7	- 3
3. Procurement of diesel-electric locomotives	6 locomotives	6 locomotives	No difference
Rehabilitation of passenger coaches	67 coaches	16 coaches	- 51 coaches (However, 20 of these passenger coaches were already rehabilitated through self-financing.)
Rehabilitation of diesel-electric locomotives	5 locomotives	—	- 5 locomotives
4. Workover of stations	Workover of 28 stations	—	Eliminated
5. Improvement of communication facilities			
VHF systems	7 sets	15 sets	＋8 sets
Cable circuit	378km	—	Eliminated
SSB transceiver	—	4 sets	＋4 sets
6. Improvement of signal facilities Tokenless system	Installation of 14 sets	—	Eliminated
7. Fencing to prevent trespassing on the tracks	Installation in San Lazaro - Mesa	—	Eliminated
8. Consulting Services	338 M/M	313 M/M	- 25 M/M

(Source: JBIC and PNR materials)

[2] Implementation Schedule Table 4



(Source: JBIC and PNR materials)

Note: The break in the construction and procurement period is due to the fact that even though the construction work was completed in June 1995, the project had to be extended to March 1996 in order to rehabilitate the Iyam Bridge that was damaged by a typhoon in November 1995.

[3] Project Cost (including charge) Table 5

(Unit Foreign currency: ¥ million Local currency: million Peso)

	Plan				Actual			
	Foreign currency portion		Local currency portion		Foreign currency portion		Local currency portion	
	(¥ million)		(million Peso)		(¥ million)		(million Peso)	
	Overall	JBIC	Overall	JBIC※1	Overall	JBIC	Overall	JBIC
Procurement of diesel-electric locomotives, rehabilitation of passenger coaches (at the beginning)	1,181	1,181	7	N.A.	1,370	1,370	39	20
Civil Works	2,682	2,682	162	N.A.	4,196	3,178※2	208	0
Consulting Service	435	435	2	N.A.	323	323	14	14
Contingency	320	320	99	N.A.	0	0	0	0
Total	4,618	4,618	270	69.2	4,871	4,871	261	34
Total Project Cost				6,317				6,150
ODA loan amount				5,054				5,037

Note 1: At the time of the appraisal a list of items to be covered by local-currency loan was not specified (this was also not covered in the Loan Agreement). The result was that local-currency loan was applied to a portion of the passenger coaches rehabilitation and consulting services.

Note 2: The contract for the "civil works" portion was amended so that rehabilitation could be made to a bridge damaged by a typhoon. However, reimbursement was made after the emergency rehabilitation.

[Exchange Rate]

At the time of appraisal: 1 peso = ¥6.3 (October 1988)

Actual: 1 peso = ¥4.9 (average rate at the time of loan imbursement)

(Source: JBIC and PNR materials)

2. Analysis and Evaluation

2.1 Evaluation on Project Implementation

2.1.1 Project Scope

The scope of this project was greatly reduced from a 443km section of track to only a 245km section of track. This was due to the fact that the submitted bids for the project far exceeded the cost estimates at the time of the appraisal.

(1) Background to Project Scope Reduction

[1] P/Q, Submission of Bids, Re-submission of Bids

P/Q was executed for a package of civil works in this project including track maintenance, bridge rehabilitation, and the installation of signal and communication facilities. At this point there were no particular technological or procedural problems and JBIC promptly agreed with the results of the P/Q evaluation (three out of nine companies passed). The bidding documents were prepared by PNR and consultants, and were based on the results of basic and detailed designs implemented by the consultants.

Bids were submitted after the completion of P/Q. Bidding price from all of the companies were close to double the estimates made by PNR based on the detailed design. At this time JBIC requested that PNR explain why all of the bids had failed, and at the same time sent a written request to PNR asking them to take measures to prevent such a situation from occurring again.

PNR conducted a second round of bidding at the request of JBIC. Here, various measures were taken to keep project expenses within the amount covered by the loan. There were changes to the list of procurement items (signal systems and some of the communications equipment were removed) and changes to procurement methods (Pandrol rail fastening parts were procured directly from the manufacturer). However, despite these efforts, all of the resubmitted bids were again rejected as they greatly exceeded the original estimates by around 1.7 times.

There were several unforeseen reasons as to why the submitted bids far exceeded original estimates. Inflation and the sudden outbreak of the Gulf War produced a sharp increase in the price of construction materials[1]. Additional expenses were tacked onto the bids to cover any sudden depreciation in the peso due to political instability at the time and to cover security measures needed at the production site.

[1] For example, the cost of a bag of cement at the time of the appraisal was 45 pesos, but increased to an average of 110 pesos in the submitted bids.

[2] Project Scope Reduction

With the re-submitted bids all being rejected, JBIC asked PNR to consider alternative courses of action. There was the strong assumption that an additional round of bidding would produce the same result. Since construction needed to be started right away, it was decided that the scope of the project would have to be greatly reduced. (PNR concluded that limiting the project to the area between Lucena and Naga would be the best option in terms of urgency, PNR's budgetary restraints, and effectiveness.)

JBIC agreed with this recommendation and direct negotiations were started with the lowest bidder in the second bidding. These negotiations were carried out, contracts were made based on the reduced scope of the project, and concurred by JBIC.

As a result, the track improvement project was reduced to the area between Lucena and Naga, contracts were made for the procurement of Pandrol rail fastenings directly from the manufacturer, and installation of signal equipment and station repairs were removed from among the items covered by the loan.

(2) Project Contents after Reduction

The following is an analysis of the reduced project scope.

(i) Civil Works

As mentioned above, the scope of this project was reduced to cover only the 245km section of the Main Line South between Lucena and Naga (the term 'project' will hereafter refer to this scaled down version of the project and the term 'Main Line South Project' will refer to the original project scope). Track rehabilitation, bridge rehabilitation and other operations for the relevant section of the line were carried out without any particular problems. EFIC (Export Finance and Insurance Corporation) was asked to provide financing for the section not to be covered by the JBIC loan (section between San Pedro and Lucena and between Naga and Legaspi). As a result, Phase II of the Main Line South Project (hereafter referred to as the 'EFIC project') was carried out after the completion of this project. This EFIC project mostly covered the track rehabilitation, bridge rehabilitation, station rehabilitation and other operations that were to be carried out in the original Main Line South project. The EFIC project was completed in July of 1998 and achieved the same goals targeted by this project; namely improved rail conditions and stable operations.

In November 1995 Typhoon Rosing struck the Philippines and caused damage to sections of the track covered by this project. According to a report by PNR, 20km to 30km of track, roughly 10% of the distance of track covered by this project, and two main bridges were washed away. Damages were said to have totaled around 250 million pesos. A portion of the remaining loan was used to repair the Iyam Bridge near Lucena, and other damaged areas covered by the EFIC project. Restoration of the damages caused by the typhoon in November 1995 was completed in 1996. Still, every year typhoons have caused small-scale problems such as tracks being covered

by landslides.

(ii) Facilities and Procurement of Rolling Stocks

There were cutbacks in the amount of facilities and rolling stocks to be procured through the loan. Specifically, fences to keep out illegal settlers[2], signal equipment, and repairs to 28 stations were removed from the scope of this project. On the other hand, the number of communication devices was actually increased. The number of VHF system sets was increased from seven to fifteen sets and four SSB system sets were added, but procurement of cable circuits was eliminated.

In terms of rolling stocks, plans were to execute two packages by ICB; a) procurement of six diesel-electric locomotives, b) rehabilitation of five diesel-electric locomotives and 67 passenger coaches (procurement of spare parts and repairs). The number of rolling stocks were calculated based on the number needed to operate ten round trips on one line and the number currently operating at the time. Six diesel-electric locomotives were procured as planned, however, the number of diesel-electric locomotives and passenger coaches to be rehabilitated using loan financing was reduced to just 16.

Rehabilitation of diesel-electric locomotives and passenger coaches were temporarily removed from the scope of this project due to the rise in overall expenses, and this rehabilitation was carried out using financing from PNR. After PNR rehabilitated the first 20 passenger coaches, LCB selected and contracted with a business for the rehabilitation of an additional 16 coaches. At this time it was determined that a small amount of the funds provided by the loan still remained. PNR asked JBIC if this funding could be used (October 1995), and a portion of the passenger coaches rehabilitation was again covered by the loan through local currency financing. Rehabilitation of the diesel-electric locomotives was not actually performed. This is because six new diesel-electric locomotives were procured, thus a comparatively greater emphasis was placed on rehabilitating passenger coaches.

Plans were to rehabilitate 67 passenger coaches, but this number was halved to just 36 coaches. At the time of the appraisal it was determined that ¥1,181 million from the loan would need to be allotted for procuring the diesel-electric locomotives and for rehabilitating the diesel-electric locomotives and passenger coaches. However, the contracted amount for just the six diesel-electric locomotives came to ¥1,370 million. The bid amounts for civil works such as track maintenance also exceeded the original estimates put forth by the executing agencies. This being the case, the removal of rolling stocks rehabilitation from among the items covered by the loan was unavoidable in order to give priority to tracks that were in the most urgent need of repair.

(iii) Consulting Services

Consulting services were provided by a Japanese company selected from a short-list. PNR

[2] Illegal settlement is especially prevalent along the commuter line in the Manila metropolitan area.

initially drafted the service TOR, but JBIC made additional proposals covering guidance on maintenance control and improving management.

TOR was amended at the time of the bidding based on these proposals. (Further details on TOR are provided later.) The amount of service performed was 313M/M which was roughly in line with the planned 338M/M.

2.1.2 Implementation Schedule

This project was completed in March of 1996, one year after the original March 1995 completion target. The project had to be extended by one year due to additional construction to repair the Iyamu Bridge, which was damaged by Typhoon Rosing in November 1995.

2.1.3 Project Cost

As a result of the sharp reduction in the scope of this project, project expenses were roughly in line with estimates made at the time of the appraisal.

However, considering that the project scope was greatly reduced, it can be said that there was a large cost overrun when looking at overall expenses for the entire Main Line South. (Expenses for the overall Main Line South project including the EFIC project was roughly 1.8 times the estimate at the time of the appraisal as seen in Table 6.)

Table 6 Total Project Cost of Entire Main Line South – Comparison of Original Plan and Actual –

(Unit: ¥ million)

At the time of appraisal			Actual				
This project			This project		EFIC project (Note)		Total
JBIC	PNR (1 Peso = ¥6.3)	Total	JBIC	PNR (1 Peso = ¥4.9)	EFIC (1US$ = ¥113.7)	PNR (1 Peso = ¥3.8)	
5,054	1,265	6,319	5,037	1,112	4,309	803	11,261

(Note) The IFS average rate for 1995~1998 was used for calculating EFIC project costs.
(Source) JBIC and PNR materials

2.1.4 Implementation Scheme

This project was carried out using a system of subcontractors. Consultants were also employed for detailed designs and construction supervision.

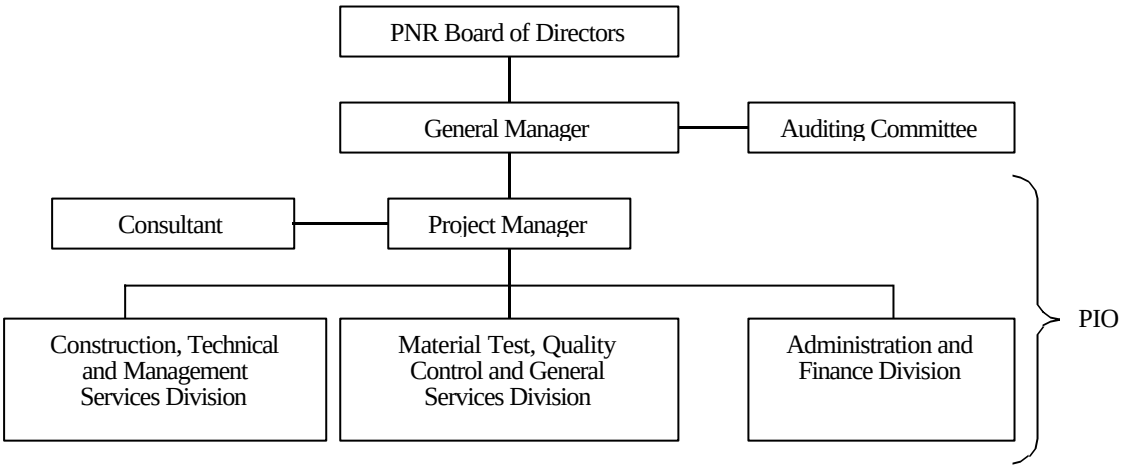
(1) Executing Agency

The executing agency for this project was the Philippine National Railways (PNR). PNR is a public corporation wholly owned by the Philippine government. PNR is overseen by the Department of Transportation and Communications. PNR is operated by a board of directors consisting of seven members and the chairman of this board is appointed by the Philippine president. The total number of PNR employees was 5,148 at the time of the appraisal, but this

number has since been reduced to 2,062.

The Project Implementation Office, established within PNR to specialize in revitalizing the Main Line South, was placed in charge of implementing this project (see Figure 2). After completion of the JBIC portion, this office was placed in charge of the EFIC project. PIO has a staff of 68 people.

Figure 2 Project Implementation Office



Within PIO the Construction, Technical and Management Services Division conducts construction-related services in the three regions of Lucena, Gumaca and Naga. The Material Test, Quality Control and General Services Division is responsible for procurement, while the management of funds is handled by the Administration and Finance Division.

The executing agency can be praised for its performance in suitably dealing with the fact that the submitted bids all exceeded the original project estimates.

(2) Consultants

As mentioned earlier, a Japanese consultant that produced F/S was selected based on the results of shortlist bidding. TOR for the consultants is as shown below. According to the executing agency, the performance of the consultants was satisfactory.

Design Stage	Evaluation of existing facilities, investigation of rolling stock conditions and operations, review of management and operations of the Main Line South, study of land expropriation, examination of the transfer of power lines, sewage drains and other facilities, basic design and detailed designs
Bidding Stage.....	Quantitative calculations, preparation of specifications, unit cost analysis, cost estimates, preparation of bidding documents, bidding assistance
Construction Stage	Construction management
O/M Related.....	Standards on track maintenance, manual review & preparation and training, study on automation of maintenance operations, review of maintenance organizations and systems, concentrated training of supervisors, education on handling maintenance equipment, establishment of track materials maintenance system

(3) Contractors

In this project contracts were made with contractors for three different packages; civil works, procurement of diesel-electric locomotives and procurement of rail fastening equipment. There have been no reports of problems regarding the performance of the contractors in any of the three packages.

2.2 Evaluation on Operation and Maintenance

After completion of construction, operations and maintenance were performed locally within the framework of the normal PNR operation and management system. In particular, the following three divisions have been making a direct contribution to the maintenance and operation of trains while remaining in contact with each other.

- Train Operations Department
- Rolling Stock Maintenance Department
- Engineering Department

2.2.1 Operational Scheme and Conditions

(1) Operational Scheme

The Train Operations Department in PNR is responsible for planning train operations, radio contact on operating times, station management and other duties. This division is responsible for assigning radio operators, station staff, railway crossing operators (flag signaling and crossing gate operations), point operator (manual) and others to rolling stocks, stations and railway crossings. Operations are managed for each of 125km-distance sections along the line between Lucena and Naga.

(2) Operational Conditions

(i) Operating Conditions

The number of trains in operation are as shown in Table 7. At the time of the appraisal there were only two roundtrip trains (both running at night), and the project was unable to increase this number due to a shortage of rolling stocks. On the other hand, the required travelling time was greatly reduced as track rehabilitation allowed for smoother operations. The target of a 6-hour travelling time between Manila and Naga was not achieved, but this time was reduced from 15 hours to 11 hours. Furthermore, better track rehabilitation resulted in fewer derailments. Figure 8 shows how the annual number of derailments decreased compared to before the start of this project. (Recent derailments have been due more to problems with the rolling stocks than with the tracks.)

Table 7 Main Line South Operating Conditions (Manila ~ Naga)

	At the time of appraisal (1988)	Plan	February 2000
Full speed	35～40km/h	100km/h	70km/h
Required travelling time	15 hours	6 hours	11 hours
No. of round trips in operation	2	5	2

(Source: JBIC materials and PNR materials)

Table 8 Annual Number of Derailments (Lucena ~ Naga)

Year	No. of derailments
1990	44
1991	37
1992	58
1993	47
1994	21
1995	16
1996	16
1997	6
1998	10
1999	20

(Source: PNR materials)

The amount of freight and passengers being transported by the rail system decreased from the level seen at the time of the appraisal (1988), with the number of passengers failing to reach the initial target of 2.5 million per year (see Table 9). There was an especially large drop in the number of passengers in 1996 as close to a year was needed to make repairs following Typhoon Rosing which struck in late 1995. However, recently the passenger situation has improved slightly as construction in both the JBIC and EFIC projects make progress.

In 1997 a daily, middle-distance (110km) roundtrip service was started between Naga and Hondagua along the Main Line South. With 471,310 passengers using this line, the total number of passengers for the entire Main Line South has reached 1,158,758. Operations on this section was halted in the next year due to the shortage of rolling stocks on the commuter Line South. Still, this shows that an increase in passengers can be expected if there is an increase in the

number of trips.

In terms of cargo freight, two transport methods are being used. One method is to use special freight cars (freight service). However, such operations are currently not possible due to a shortage of locomotives needed to pull the freight cars. The other method is to attach a baggage car to the passenger coaches that make two roundtrips each day, and use this freight car to carry the passengers' cargo (produce and others). However, the amount of freight transported by this method has decreased in recent years. Completion of this project helped to greatly improve regularity on the Main Line South. Still, much time is needed for the loading and unloading of freight at each station, and this has resulted in train delays.

Table 9 Changes for Transport of Passengers and Cargo Freight in the Main Line South

	Passenger transport			Cargo transport			
	No. of passengers	Passenger transport volume	Revenue	Freight service	Baggage car	Cargo transport volume	Revenue
	Person	1,000 persons・Km	1,000 peso	ton	ton	1,000 tons・Km	1,000 peso
1985	749,044	145,602	41,977	53,981	19,465	17,189	14,229
1986	909,604	173,162	45,519	63,996	21,496	19,384	15,459
1987	1,177,763	219,125	61,220	62,250	27,665	21,735	17,356
1988	984,885	230,075	64,768	57,020	23,110	20,547	18,634
1989	1,004,711	250,071	70,042	53,182	21,487	18,330	18,898
1990	928,038	270,954	75,644	32,170	16,769	11,946	14,362
1991	754,970	182,103	65,546	11,629	10,310	5,312	11,606
1992	466,755	120,998	43,936	4,932	8,460	3,399	8,356
1993	401,702	101,770	34,469	17,541	7,325	6,959	10,165
1994	426,002	106,272	37,910	12,310	7,195	5,145	10,308
1995	598,031	163,558	62,002	14,077	6,230	5,877	9,371
1996	299,460	68,515	25,303	-	1,743	541	1,751
1997	1,158,758*	175,068*	85,375	675	3,779	1,355	4,384
1998	579,749	181,302	90,306	-	3,484	1,134	5,646
1999	540,914	172,327	87,636	-	2,791	943	n.a.

*: The number of passengers and the amount of passenger freight for 1997 include the operations between Naga and Hondagua.

(ii) Condition of Locomotives and Passenger Coaches

A typical train traveling on the Main Line South is configured of one diesel-electric locomotive, one air-conditioned passenger coach, four economy-class coaches and one baggage car. The average congestion rate for air-conditioned is close to 100%, which for normal cars at 75%. However, it has been impossible to increase the number of trips due to a shortage of locomotives and passenger coaches. The situation of locomotives and passenger coaches owned by PNR, as well as a comparison with the situation at the time of the appraisal are as shown in Table 10.

This table shows that the rate of operation has gotten worse. In particular, the ratio of rolling

stocks waiting for repairs or incapable of being repaired has increased. PNR has been unable to procure the needed spare parts due to budget constraints. Spare parts were also bought when this project purchased the six locomotives. That is why these trains are still in operation.

Table 10 Conditions of Locomotives and Passenger Coaches

	Overall PNR (1986)		Overall PNR (2000)	
	Diesel-electric locomotives	Passenger coaches	Diesel-electric locomotives	Passenger coaches
Total	62	158	42	129
Under operation	24	41	14	19
(Operating ratio)	39%	26%	33%	15%
Under repair	11	22	13	27
Waiting to be repaired	27	95	9	24
Cannot be repaired	N.A.	N.A.	6	59

(Source: PNR materials)

(Note) Many of the locomotives are used in the commuter lines. Passenger coaches of the commuter lines are not included in the table.

The lack of passenger coaches is a particularly serious problem. Therefore, a Japanese railway company donated 21 used passenger coaches to PNR in late 1999 with the initiative of a JICA specialist. Expectations are that a train consisting of seven air-conditioned cars will make three roundtrips each day on the Main Line South.

(3) Competition with Buses

Train service continues to suffer in comparison with bus service in terms of the required travel time and the number of trips, as shown in Table 11. Bus transport has enjoyed shorter travelling times and better efficiency due to ongoing rehabilitation to the national roads. Both train and bus transport still have high congestion rates. The Main Line South is still the cheaper alternative and offers a more comfortable ride as passengers can get up and move about the coaches. Therefore it is assumed that there is a large latent demand for train travel. If train traveling times can be shortened and if more trips can be offered, then it is assumed that more passengers will shift from buses to trains.

Table 11 Comparison with Bus (Manila ~ Naga)

	At the time of appraisal		February 2000	
	Main Line South	Bus	Main Line South	Bus
Required travelling time	15 hours	9 hours	11 hours	8 hours
Fare (economy)	93.9 Peso	115.5 Peso	169 Peso	266 Peso
Fare (air-conditioned)	140 Peso	147.6 Peso	234 Peso	342 Peso
No. of round trips in operation	2	35	2	N.A. (many)
Congestion rate	N.A.	N.A.	Ordinary: 75% Air-conditioned: 100%	Almost full

(Source: PNR materials and interviews)

2.2.2 Operations and Maintenance Scheme

(1) Remarks

Currently the maintenance of locomotives and passenger coaches, as well as the maintenance of tracks, can not be adequately performed by PNR due to shortages in financing, equipment and personnel. As mentioned before, this is basically due to the poor financial situation within PNR. Furthermore, the inadequacies in maintenance are not simply limited to financial problems, but are also related to problems with PNR management. Further details are given below.

(2) Maintenance of Locomotives and Passenger Coaches

Maintenance of locomotives and passenger coaches is carried out by the Locomotive Maintenance Unit, the Long-Distance Passenger Car Maintenance Unit and the Commuter Passenger Coaches Maintenance Unit within the Rolling Stock Maintenance Department (240 employees). The Rolling Stock Maintenance Department prioritizes which rolling stocks should be repaired and a separate procurement department is contacted for the purchasing of spare parts.

However, recently there have been difficulties in procuring spare parts due to the financial restraints and repairs to broken rolling stocks have had to be postponed. Furthermore, this project and the "Railcar Maintenance Depot Construction Project"[3] have promoted preventative maintenance (thorough inspections and maintenance to prevent faults from occurring) through expert instruction by consultants and through the creation of manuals. There have been great expectations for this type of transfer of technology, but this preventative maintenance has not always been carried out by PNR, and probably will not be sufficiently carried out until there are improvements with PNR's maintenance and management methods. This preventative maintenance is different from PNR's standard method of only fixing problems after they occur. Even though such preventative maintenance would save money over the long run, the practice has not become firmly established because it requires periodic labor and expense. The main cause of this situation is the financial difficulties at PNR that prevent adequate funds from being allotted to maintenance.

Another problem was that some of the younger engineers that received direct training from the consultants left PNR in search of higher wages elsewhere. At the time of the appraisal JBIC was aware of the necessity for improving PNR's maintenance scheme and several measures were taken. Such measures involved including training and instruction in the consultants' TOR, and the issuing of periodic maintenance reports to PNR after the procurement of the diesel-electric locomotives. Even though these measures had a marked effect, they were not adopted as changing PNR's longstanding maintenance scheme proved to be difficult.

[3] A loan agreement was signed in September 1983 and the loan amount was ¥4,500 million. This project included the construction of the rolling stocks maintenance depot, the procurement of locomotives and spare parts, and the provision of consulting services (including management assistance).

(3) Track Maintenance

Track maintenance, including bridges, is implemented by a total of 200 employees belonging to each of the four regions of Manila, Lucena, Hondagua and Naga. Teams of roughly five individuals are assigned to 5km sections within each region. They run small trolleys and make inspections and perform simple maintenance to rails, fastenings, ballast, drainage ditches and others on a daily basis. There are also continuous inspections and testing provided once a week for each 25km section. Also an inspection car is run for every 125km section to provide inspection and testing twice a month.

However, in terms of track maintenance, the cleaning of drainage ditches and the track itself (cutting grass, etc.) has been insufficient. As a result, test rides have found sections were the conditions have deteriorated due to rainwater accumulating on the tracks and damage to the wooden ties. There are concerns that the condition of the tracks will continue to worsen if this maintenance situation continues.

2.2.3 Financial and Administrative Conditions

(1) PNR Revenue Situation

PNR's recent profit and loss figures and those for at the time of the appraisal are shown in Table 12. There have been both operating losses and net losses every year. There continues to be net losses even when subsidies are provided. In recent years the provided subsidies have tended to become smaller and PNR has been forced to rent and sell land and make other efforts outside of the railway business to secure revenue sources.

Table 12 Statements of Income for PNR

(Unit: 1,000 peso)

	1987	1994	1995	1996	1997	1998
Operating Revenues						
Railway Business Revenue	86,762	64,369	85,487	38,052	105,553	117,713
Others (hospital management, etc.)	4,405	5,022	8,953	11,344	13,579	11,561
Sub-total	91,167	69,391	94,440	49,396	119,132	129,274
Operating Expenses						
Personnel	118,224	186,020	229,826	258,951	319,132	377,847
Fuel and lubricants	26,220	18,428	19,285	14,632	20,410	22,716
Maintenance & other operating expenses	27,920	27,962	43,012	51,428	58,584	60,769
Sub-total	172,364	232,410	292,123	325,011	398,126	461,332
Operating Profit	-81,197	-163,019	-197,683	-275,615	-278,994	-332,058
Non-operating Revenue						
Real estate rentals	52,060	72,651	57,424	74,653	72,612	83,480
Others	1,088	11,006	15,749	4,680	7,381	3,981
Sub-total	53,148	83,657	73,173	79,333	79,993	87,461
Non-operating Expenses						
Depreciation	89,717	99,519	100,775	98,766	99,344	99,461
Interest expenses etc.	-	63,225	375,708	265,987	329,914	651,243
Sub-total	89,717	162,530	479,311	358,476	445,050	756,307
Net Income (without subsidy)	-117,766	-241,892	-603,821	-554,758	-644,051	-1,000,904
Subsidies	108,700	307,102	439,570	262,977	236,608	135,580
Net Income (with subsidy)	-9,066	65,210	-164,251	-291,781	-407,443	-865,324

(2) PNR Management Problems

At the time of the appraisal, the new government had appointed a new general manager to run PNR. This president exercised strong leadership and promoted various policies for improving operations. These policies included bolstering the operation and maintenance scheme, improving the regularity of operations and services such as cleaning, improving wages and generating more income through the more efficient use of property. At the time of the appraisal the effects of these policies were already being seen. The number of passengers using the Main Line South had increased by 20% to 30% annually over the previous three years. However, before long this president was replaced and the strong leadership needed for improving PNR management was lost.

The various problems with PNR management became evident during and after the JBIC projects (Philippine National Railways Commuter Service Projects I and II, Railcar Maintenance Depot Construction Project) which preceded this project. In 1993 SAPS (Special Assistance for Project Sustainability) was conducted to study PNR's railway operation and management status and to make proposals for improving the situation. The SAPS report said that insufficient maintenance and a weak financial management system were the leading obstacles to railway operations. This report also worked out concrete action plans to address these problems.

PNR attempted to improve operations and management based on these action plans, and results were seen in the areas of improved operation regularity and cleaning. However, these improvements failed to extend to the basic management system in such areas as improving the financial situation and bolstering the maintenance system.

If adequate investment is made in facilities and equipment, and enough maintenance is always performed, than the qualities of the rail transport business will be kept. However, if the executing agency has a poor management system, transport capabilities are weakened by insufficient maintenance, and the ability to compete with buses and other transport means is compromised, then the entire system will fall into a vicious cycle in which demand decreases and the much needed capital is reduced.[4]

Therefore, the Philippine government is studying plans for improving PNR management by bringing in the private sector and taking other measures. In this manner it hopes to drastically reform PNR management and services.

[4] This does not have much of a direct relationship to this project, but the problem of illegal settlements along the commuter line in the Manila metropolitan area has had a major influence on PNR's overall operations. It is said that there are some 10,000 households living illegally right along the tracks. This causes a hindrance to train operations and makes it difficult to provide the passengers with a pleasant environment. Furthermore, wastewater from these illegal settlements has damaged the tracks, and some of these residents have stolen rail ties and ballast to use as construction materials. This has all caused serious problems for operating and maintaining the tracks.

2.2.4 Environmental Impact

At the time of the appraisal it was determined that there should be no impact on the natural environment as the main component of the project was the restoration of existing facilities. In fact, no such problems occurred.

2.2.5 Impact on Local Residents

In some sections of the Main Line South (particularly in the Bicol region) there has been the problem of people illegally using the PNR tracks to operate vehicles such as trolleys. This is a short-distance transport method called "skate" in which roughly 10 people can be transported by human-power. According to PNR, there have not been any collisions between the trains and skates in recent years. Currently there is a fixed number of trains running at set times, and the skate operators seem to be aware of the train operating conditions. Skate transport is illegal, but has become an important means of transport for those living along the Main Line South. Therefore, it would be very difficult for PNR to try and eliminate skaters.

2.3 Project Effects and Impacts

2.3.1 Quantitative Effects

(1) Shorter Travelling Times

Through improved track rehabilitation, the maximum travelling speed was increased from 35~45km/hr to 75km/hr. The time required to travel between Manila and Naga before the start of the project was 15 hours, but this was reduced to 11 hours upon completion of the project.

(2) Transport Volume

The number of train services was not increased, and there were decreases in the amounts of passengers and freight transported.

(3) Fewer Derailments

The number of derailments decreased following track restoration. In 1990 there were 44 reported derailments between Lucena and Naga, but this number was reduced to only six in 1997 after the project was completed.

(4) Financial Internal Rate of Return (FIRR)

At the time of the appraisal it was estimated that this project would produce an FIRR of 7.9% due to better passenger earnings. However, the Main Line South has been recording losses each year up until now due to the decrease of transport volume and increasing operation expenses in the Main Line South. Therefore, calculation of FIRR has been postponed at the present time.

2.3.2 Qualitative Effects

The following are three points of how train service has been improved.

(1) Improved Safety

Safety was improved by reducing the number of derailments.

(2) Improved Regularity

There is still room for improvement, but there has been definite improvement in the regularity of train operations due to the faster travelling speeds and fewer derailments.

(3) Better Ride

Track maintenance has helped to reduce train vibrations and provide passengers with a better ride.