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Report No. 8265

PROJECT COMPLETION REPORT

KOREA

COAL AND CEMENT DISTRIBUTION PROJECT

LOAN 2267-KO

DECEMBER 26, 1989

Infrastructure Operations Division
Country Department II
Asia Regional Office

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CURRENCY EQUIVALENTS

Currency Unit - Won (W)

US\$1	=	W745 (as of January 1983)
US\$1.34	=	W 1,000
US\$1 million	=	W 745 million
US\$1,340	=	W 1 million

CTC	-	Centralized Traffic Control System
EPB	-	Economic Planning Board
ERR	-	Economic Rate of Return
IBRD	-	International Bank for Reconstruction and Development
KMPA	-	Korea Maritime and Port Administration
KNR	-	Korean National Railroad
MOC	-	Ministry of Construction
MOER	-	Ministry of Energy and Resources
MOF	-	Ministry of Finance
MOT	-	Ministry of Transport
MOTC	-	Ministry of Transport and Communications
NEPA	-	National Environmental Planning Authority
PCR	-	Project Completion Report
POSCO	-	Pohang Steel Mill Company
SAR	-	Staff Appraisal Report

GOVERNMENT OF KOREA

FISCAL YEAR

January 1 - December 31

THE WORLD BANK
Washington, D.C. 20433
USA

Office of Director-General
Operations Evaluation

December 26, 1989

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Korea Coal and Cement Distribution
Project (Loan 2267-KO)

Attached, for information, is a copy of a report entitled "Project Completion Report on Korea - Coal and Cement Distribution Project (Loan 2267-KO)" prepared by the Asia Regional Office with Part II of the report contributed by the Borrower. No audit of this project has been made by the Operations Evaluation Department at this time.

Attachment

A handwritten signature in black ink, appearing to be 'R. P. ...', is written over a faint rectangular box.

KOREA
COAL AND CEMENT DISTRIBUTION PROJECT
LOAN 2267-KO
PROJECT COMPLETION REPORT

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KOREA

COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)

PROJECT COMPLETION REPORT

PREFACE

This is the Project Completion Report (PCR) for the Coal and Cement Distribution Project in Korea, for which Loan 2267-KO in the amount of US \$ 122.0 million was approved on April 26, 1983. The loan was closed on December 31, 1988, one year behind schedule.

The PCR was prepared by the Infrastructure Division of the Asia Region (Preface, Evaluation Summary, Parts I and III), and the Borrower (Part II).

Preparation of this PCR was started during the Bank's final supervision mission of the project in November 1988, and is based, inter alia, on the Staff Appraisal Report, the Loan and Project Agreements, supervision reports, correspondence between the Bank and the Borrower, and internal Bank memoranda.

KOREA

COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)

PROJECT COMPLETION REPORT

EVALUATION SUMMARY

Objectives

i. The objectives of the project were twofold: (a) provision of necessary capacity in rail, ports and inland terminals to efficiently handle the forecasted coal and cement traffic through the 1980s; and (b) correction of system inefficiencies in coal and cement distribution which included: (i) dealing with the complexity of the distribution system due to the fragmented coal mining and briquette industries, and the utilization of scale economies in the transportation of coal imports and; (ii) reversing the habit of transporting and distributing large proportions of cement in bags rather than bulk. (See para. 3.01).

Implementation Experience

ii. After the project was approved by the Bank in April 1983, energy prices and markets fluctuated widely and the Korean Government took a number of decisions regarding energy mix and energy imports. This made a review of the project investments necessary. A mission visited Korea in August 1984 and reviewed both the port and railway components in light of the new economic situation. The re-appraisal report was issued on October 15, 1984. (See paras 3.03 - 3.08.)

iii. After the re-appraisal, implementation of the project progressed smoothly and by December 31, 1988, all project components were completed satisfactorily. There were no cost-over runs, and in fact substantial procurement savings were realized. Although there was a two-year delay in the Jung Ang Line electrification and Taebaeg Line signalling system components, due to reduced traffic forecasts and budgetary constraints, the resultant impact was a one year delay in completion of these components. There was also a four month delay in completion of the ports component due to a labor dispute. However issues here were resolved quickly without seriously impacting project implementation. As a result of the above delays the Government of Korea requested, and was granted, a one-year extension to the loan. (See paras. 4.01 and 4.02)

Results

iv. The initial intention of the project, to rationalize the distribution of coal and cement, increasing those amounts carried by rail, was to a large extent realized. The development of the Bugok intermodal terminal also proved to be a major benefit. This facility was originally designed to provide intermodal services for cement, coal and containers but due to project restructuring, coal facilities were dropped and additional container space provided. As a result the Korean National Railroad (KNR) has become more active in the shipment of containers in the Seoul Pusan corridor, increasing its volume from about 600,000 tons in 1982 to in excess of 2.4 million tons in 1988. KNR has already expanded the total area of the terminal and has plans for an additional expansion in the near future. The Seoul Metropolitan Region Transport Study, funded under the project, led to the Bank's 1989 Road Improvement Project. The installation of a state of the art coal terminal at the Port of Incheon has enabled the Government to lower the end cost of imported coal through more efficient handling operations, and the additional rolling stock purchased will permit KNR to improve distribution and reduce the cost of its bulk handling operations. The electrification of the Jung Ang line directly under the project, the Seoul-Kuro and Keumcheong-Sandong lines, as a result of the project study, and the installation of the CTC on the Taebaeg line has enabled KNR to increase the capacity of these sections, and as more of the network becomes electrified, will enable it to reduce its capital and maintenance costs by standardizing its locomotive fleet. Finally, this project has also played a significant role in increasing the operational efficiency of KNR. (See para. 5.01)

Sustainability

v. The project was successful in that it satisfied all of its objectives and due to the critical need for increased capacity in the transport sector the project's achievements are expected to be sustained and even expanded. (See paras 4.02 and 5.01)

Findings and Lessons Learned

While the project yielded significant results, these were achieved for the most part in spite of project design, rather than because of it. Some of the lessons learned include:

- i) The complexities of the issues involved went far beyond the transport of coal. This fact illustrates the importance of considering the total socio-economic context of a project during the formulation stage (see paras. 5.02 and 5.03);
- ii) In order to be able to do the above, the full support of all agencies involved is needed, otherwise project design may take place in a vacuum with obvious serious implications (see para 5.04);

- iii) Even though the policy environment changed dramatically during project implementation, flexibility in project design allowed for a minimum of disruption. What the project highlighted was the need for continued close involvement of staff during the implementation stage (see para. 5.05);
- iv) Cost under-runs have become a problem in many Asian countries, including Korea. Local conditions are seldom taken into consideration to the extent required in cost estimates. As a result of over-reliance on international prices, appraisal costs are less reflective of the true situation (see para. 5.06);
- v) Projects often change somewhat in scope during the formulation and final design stages. To assess project benefits as accurately as possible, full economic analyses need to be prepared on all major components at an advanced stage of project design. To further facilitate accuracy detailed designs should be completed before project approval (see para. 5.07);
- vi) The impact of disruption to the environment due to the construction of the coal facility was not fully appreciated during project design. Popular concern with the quality of life has become an important component of the Korean psyche (see para 5.08); and,
- v) Implementation of regular tariff increases and the introduction of a cost-based tariff system to enable an organization to recover the full cost of its operation remains difficult to implement for social reasons. Experience with this project suggests that it may be more useful to assist an organization to reduce its operating costs and expand its market as an alternate means to increase profitability (see para. 5.09).

KOREA

COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)

PROJECT COMPLETION REPORT

PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

I. SUMMARY PROJECT DATA

Project Name	: Coal and Cement Distribution		
Loan Number	: 2267-KO		
RVP Unit	: Asia	Loan Amount	: US\$122.0M
Country	: Korea	Cancelled Amount	: US\$ 67.97M
Sector	: Transport	Disbursed Amount	: US\$ 54.03M
Subsectors	: Railways and Ports		

Approval Date	: 4/26/83	Staff Appraisal	: April 1982
Effective Date	: 9/30/83	Re-Appraisal Report	: 10/15/84
Completion Date	: 12/31/88	Total Project Costs	: US\$479.4M

Appraisal ERR:	: 19%	Re-Assessed ERR	: 13%
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II. BACKGROUND AND SECTORAL SETTING

Appraisal Context

2.01 The Coal and Cement Distribution Project was first conceptualized in late 1977. At that time the proposed project sought to emphasize the need to rationalize the distribution of coal and cement within Korea. However, due to frequent changes in personnel in the Ministry of Transport and Communications (MOTC) and differing government priorities, the proposed project did not, initially, have strong government support. It was not until the second oil crisis, in late 1979, when the importation of coal took on new urgency, that the project actually began to take form. Energy substitution becoming the catalyst for project formulation.

2.02 Due to Korea's limited domestic energy resources, most energy demand must be met by imports. This was true in 1980 and continues to be true today. This heavy dependence on imported fuel made energy security one of the most challenging policy objectives for Korea. The second oil shock provided the spur to enforce all-out energy conservation measures and oil substitution through diversification of energy sources. As a result, energy sources such as bituminous coal, nuclear energy and LNG were seriously introduced into the energy matrix. Anthracite coal, which is used primarily to make briquettes

for household heating and cooking, is mined in Korea, but there are no known reserves of bituminous coal.

2.03 With the government policy of fuel diversification, which included substantial increases in coal imports, attention was drawn to the port receiving facilities and rail transportation system for the distribution of both anthracite and bituminous coal.

2.04 In reviewing the facilities and systems, a number of issues came to the fore: (a) the relatively low proportion of bulk handling, which was considered more efficient than bagged transport (SAR para. 3.08) in cement distribution; (b) the transport complexities of domestic coal distribution resulting from the fragmentation of the mining and briquette-making industries, where primary flows were concentrated on rail lines connecting Seoul, Daejeon and Daegu (SAR paras. 2.11, 2.12); and (c) the lack of efficient handling capacity and inadequate transportation systems for imported coal distribution (para. 2.15). The ports of Incheon, Ulsan, Mogpo and Bupyeong were selected to handle imported coal traffic for household and industrial uses other than those of the steel mills or large power plants which have their own ports. New terminals were needed at these ports to handle the expected coal traffic. Only the terminals at Incheon and Ulsan were included in this project, the other two ports were to be developed later since they were less urgent. Rail transport from Incheon Port was to be conducted via the Suwon-Incheon line. Project planning, forecasting and the preliminary design of facilities were all based on the assumption of rising oil prices and continued and escalating importation of coal.

III. THE PROJECT

3.01 Original Project Objectives and Components. The original objectives of the project included: (a) provision of necessary capacity in rail, ports and inland terminals to efficiently handle the forecasted coal and cement traffic through the 1980s; and (b) redressing system inefficiencies in coal and cement distribution including: (i) for coal, the complexity of the distribution system due to the fragmented coal mining and briquette industries, and the utilization of scale economies in the transportation of coal imports and; (ii) for cement, the large proportion of cement still transported and distributed in bags rather than bulk (SAR para. 4.01).

3.02 Project components originally consisted of:

- (a) Investments to increase capacity in specialized intermodal freight terminals for coal and cement at Bugog and Seongbug; port infrastructure at Incheon and Ulsan; rail infrastructure on the Suwon-Incheon (Su-In) line, electrification of 64.8 km of the Jung Ang line, installation of a Centralized Traffic Control System (CTC) on 126.8 km of the Taebaeg line and, specialized cars for coal and cement transport;
- (b) measures to address system inefficiencies included policy measures regarding transport pricing of anthracite and bituminous coal and of bulk and bagged cement, improvements in train operations and locomotive utilization, operational improvements at the two project

ports, and technical assistance and training. A Seoul Metropolitan Region Transport Study was also approved under the project (SAR para. 4.02).

3.03 Re-Appraisal. After the project was approved by the Bank in April 1983, energy prices and markets fluctuated widely and the Korean Government took a number of decisions regarding energy mix and energy imports. This made a review of the project investments necessary. The mission which visited Korea in August 1984 reviewed both the port and railway components and determined that the main differences between the situation at the time of Board presentation and re-appraisal were as follows:

- (a) The rapid build-up of anthracite imports between 1979 and 1981, combined with rather mild winters, resulted in a sizeable stockpile (about 5-6 million tons). The Government decision to import LNG to gradually replace anthracite coal for household heating and cooking made the importation of large quantities of coal less imperative. The combination of these factors led the Ministry of Energy and Resources (MOER) to drastically reduce its forecast for anthracite imports and eliminate all anthracite imports after 1986.
- (b) The stabilization and even slight decrease in oil prices reduced the pressure for converting industrial boilers from oil to coal. This resulted in a re-examination, by MOER, of previous forecasts of bituminous coal import requirements.

3.04 In addition, the Government decided to build a large coal receiving terminal at Kwang Yang which solidified its position as a coal receiving hub. From this port, accessible to large coal carriers, coal was to be redistributed by coastal ships to cities and industrial areas, mostly along the southern coast and the eastern coast up to Ulsan. Finally, traffic on the two railway lines serving the domestic mining areas and the cement factories was growing at a somewhat lower rate than anticipated. The effect of all of the above on traffic forecasts for imported coal, was significant. The result was a substantial decrease in projected traffic.

Port Component

3.05 Due to the reduction in coal traffic forecasts, the Government decided to postpone the Ulsan port component of the project. For Incheon, the project description given in the Loan Agreement remained valid, except that the design of the dolphins was slightly modified to make the jetty able to receive 150,00 DWT ships (lightened to 100,000 tons at Kwang Yang Bay), instead of 100,000 DWT ships.

Railway Component

3.06 For the railway component of the project, there were four main differences between the original and the revised plans:

- (a) The gauge widening of the Su-In line and the expansion of the Seong-bug intermodal terminal were postponed beyond the plan period;

- (b) The electrification of the Jung Ang line and the signalling of the Taebaeg line were postponed by about two years;
- (c) The investments in the Bugog intermodal terminal were scaled down by about 22% by deleting the general cargo area; completion of the container yard was advanced by one year while completion of the coal and cement yards was postponed by one year; and
- (d) Two new items were included in the project: (i) purchase of additional freight cars; and (ii) purchase of 20 diesel engines with mair generators, as replacements for existing locomotives.

Studies

3.07 The Gyeonggi Multimodal Transport Study was an integrated investment preparation study for road and rail developments around Seoul. The study was divided in two phases; phase one, financed under the Seventh Railway Project (Loan 1836-KO), consisted of the preparation of a regional investment program for the period 1985-91 designed to accommodate rail and road traffic demand in the area until year 2000. It began in January 1984 and was carried out by consultants BCEOM/KRIHS under a contract with the Bureau of Public Roads, MOC.

Phase two, financed under the Coal and Cement Distribution Project (Loan 2267-KO), consisted of a feasibility study of project alternatives with a view to identify a first Gyeonggi Transport Project planned for Bank consideration in FY87. Phase two began in December 1984 and was completed in November 1985.

Project Revisions

3.08 Since the original appraisal, MOF made four requests to amend the Loan Agreement, two of which were agreed to by the Bank on May 1 and November 19, 1985. The third and fourth requests, were dated January 2, and July 16, 1986. The final cancellation represented those funds that were not disbursed under the project. The successive loan amounts which were cancelled were as follows:

	Cancellations --- (US\$) ---	New Loan Amount ---- (US\$) ----
Original Loan Amount		122,000,000
First Cancellation (05/01/85)	36,762,000	85,238,000
Second Cancellation (11/19/85)	8,997,000	76,241,000
Third Cancellation (01/02/86)	10,758,000	65,483,000
Fourth Cancellation (7/16/86)	11,033,000	54,450,000
Final Cancellation (7/25/89)	421,454	54,028,546

IV. PROJECT IMPLEMENTATION

4.01 After the re-appraisal, implementation of the project progressed smoothly and by December 31, 1988, all project components were completed satisfactorily. There were no cost-over runs, and in fact substantial procurement savings were realized. Although there was a two-year delay in the Jung Ang Line electrification and Taebaeg Line signalling system, this was due to reduced traffic forecasts and budgetary constraints. There was also a four month delay in completion of the ports component due to a labor dispute, and a one year delay in completion of the rail component due to delays in project start-up. Outstanding issues were, however, resolved quickly without seriously impacting project implementation. As a result of these delays the Government of Korea requested, and was granted, a one-year extension to the loan.

4.02 All investments to increase port and rail line capacities have been completed. In addition, two specific investment recommendations made under the study have begun. These include: the Seoul-Kuro line electrification and double tracking and, installation of a new double line/electrified track on the Keumcheong-Sadong line. The Seoul-Pyotaek electrified double track extension is scheduled to begin in 1990. The objective to increase bulk transport of cement has been achieved, rising in 1988 to about 50% of total rail cement transport, from approximately 25% in 1981. Substantial procurement savings, due mainly to Korean contract awards, were also realized. All project covenants, except for those relating to rail tariffs and the profitability of Korean National Railroad (KNR) have been complied with (see paras. 4.04-4.06).

Financial Analysis

4.03 Incheon Coal Port Terminal. It is not presently possible to compare the actual results of operations with those that were forecast at appraisal because the terminal did not become operational until late 1988.

4.04 Korean National Railroad. The financial performance of KNR during the five years 1983-88 represented a dramatic improvement from its performance in the late 1970s and early 1980s and was impressive when compared to that of other railroads in the world. Throughout this period, KNR was able to generate an operating ratio, based on revalued assets, of between 94% and 98%. That ratio, however, improved considerably when only commercial operations were included, but the rate of return of about 3.3% for commercial services, during the final years of the project, was still below the levels of 5.5% and 5%, for 1987 and 1988 respectively, as set forth in section 4.07 of the Loan Agreement. Despite the strong operating performance, KNR's liquidity remained low and substantially below the levels set forth in section 4.08 of the Loan Agreement. The reasons for KNR not achieving the targeted levels of profitability and liquidity are primarily due to its inability to earn a profit from transporting coal, cement and other bulk commodities and because the Government is still unwilling to fully compensate KNR for the costs that it incurs in its non-commercial services.

4.05 During these five years, annual losses from bulk operations averaged in excess of W 4.0 million, and the coal operations represented about 70% of that loss. The project attempted to improve KNR's operating results by improving some of the bulk operating procedures, introducing a series of regular real tariff increases, and increasing the compensation provided to KNR for the losses it incurred from its non-commercial services. The results from these measures were mixed. The operating improvements proposed in the project were successfully implemented. The major problem with them was that they were very limited in scope. Subsequent Bank studies of KNR's operations have proposed more extensive improvements which would, if implemented, have a major impact on reducing KNR's bulk operating costs. The lesson the Bank has already learned is to place greater emphasis on helping our borrowers increase the efficiency of their operations and thereby reduce the overall unit cost.

4.06 With respect to the tariff increases, the project proposed a series of selective annual increases in passenger and freight tariffs averaging 1% per year in real terms. In addition, it proposed increases in the freight rates charged for coal and cement such that the tariffs for each commodity would, by 1985, cover the full cost of their operations. The project failed to realize the above tariff increases because the Government stopped all rate increases in 1985 in an attempt to stabilize domestic prices. Additionally, the project was also unsuccessful in its attempt to encourage the Government to fully compensate KNR for the cost of the non-commercial services that it provides.

Economic Analysis

4.07 Due to the fact that ultimate use for some of the components is not yet known, and because the data concerning the improved efficiency of the system, such as increased capacity, etc. is simply not available, a retrospective rate of return for the project has not been calculated. With potential changes in use of the port component and extension of usefulness of both of the rail components, it would be more beneficial to consider a re-examination of benefits at some point in the future, when the proposed changes will have begun to demonstrate more accurately the usefulness, or benefits, associated with the components financed under this project. Detailed economic analysis prepared during project appraisal was conducted for five of the project components including: Incheon Port and Su-In line; Ulsan Port; Taebaeg line Signalling; Jung Ang Line Electrification and; Cement Tank Cars. With the change in project scope at time of re-appraisal two of the above components, Su-In line and Ulsan Port, were dropped. Furthermore, those benefits identified for the Taebaeg line signalling component at the time of appraisal are no longer valid. These included savings in anthracite imports (curtailed in 1986) and cement traffic diversion (never realized) to the line. A more detailed discussion of the levels of traffic and the changes that have taken place in the various project components are set forth below along with a calculation, where possible, of the ERR for the individual project components.

4.08 Between 1982 and 1988, in the overall railway system there was a 29% increase in the amount of coal transported and a 38% increase in cement transported. Within that time-frame, however, the railroad's share of the domestic freight traffic, both in terms of tons and ton kilometers, declined. Between the years 1981 and 1985, for example, there was a 4% drop in the proportion of coal transported by rail.

4.09 At the time of appraisal, imports of bituminous coal were expected to escalate significantly through the Port of Incheon. With the re-assessment of domestic need these forecasts were decreased. As a result, the 1986 projected traffic (in the SAR) was not realized, falling short of the expected level by about 13%. As well, present 1991 forecasts are estimated to be about 23% below original SAR projections. Nonetheless, with the completion of the facility, coal traffic is anticipated to increase from approximately 3.4 mt in 1989 to 4.3 mt by the year 2000. In the SAR the ERR for the coal terminal at Incheon was combined with the gauge widening of the Su-In line, with a projected ERR estimated at 22%. The Su-In line component was not included in the re-appraised project. The ERR for the Incheon Coal Terminal alone has been estimated to be about 19%, but this could change significantly in the near future depending on whether an additional use for the coal pier is introduced. Discussions for extending the use of this facility are presently underway.

4.10 In as far as cement transport is concerned, during 1981-1985 there was a 2% increase in transport by rail and 6% increase by sea, with rail remaining as the dominant distributor. In the SAR the estimated ERR for the purchase of the cement tank cars was 68%, and the estimated ERR on completion of the project is 72%.

4.11 As far as the two project rail components are concerned, rail traffic on the Jung Ang line has failed significantly to meet SAR expectations. Passenger and freight traffic are about half that expected in 1986, and even in 1988 fell far below the SAR projection for 1986. Information on the Jung Ang Line electrification is limited and given the expected further electrification of an adjoining segment of the line, which could significantly impact the lines' usefulness, it is considered to be premature to assess the benefit of this project segment as it now stands. The situation on the Taebaeg line is more encouraging, with traffic being about 25% higher than SAR expectations. However since the original benefit streams are no longer valid (para. 4.07), and there is insufficient quantifiable information available at present concerning benefits, an ERR for this component has not been calculated. It should be noted that in both rail components, coal traffic has substantially impacted total freight flows. In the Jung Ang line component it has led to significant decreases in overall flows and in the Taebaeg Line to significant increases.

V. PROJECT RESULTS AND LESSONS LEARNED

Project Results

5.01 The project has provided the economy, Korea Maritime and Port Administration (KMPA) and KNR with a number of significant benefits, some of which had been originally envisaged and others not. The initial intention of the project, to rationalize the distribution of coal and cement, increasing those amounts carried by rail, was to a large extent realized. The development of the Bugok intermodal terminal has also proven to be a major benefit. This facility was originally designed to provide intermodal services for cement, coal and containers but due to project re-structuring, where coal facilities were dropped and additional container space provided, KNR has become more active in the shipment of containers in the Seoul-Pusan corridor, increasing its container volume on the corridor from about 600,000 tons in

1982 to in excess of 2.4 million tons in 1988. KNR has already expanded the total area of the terminal and has plans for an additional expansion in the near future. The Seoul Metropolitan Region Transport Study, funded under the project, has resulted in the Bank's 1989 Road Improvement Project with the Ministry of Construction. The installation of a state of the art coal terminal at the Port of Incheon has enabled the Government to lower the end cost of imported coal through more efficient handling operations, and the additional rolling stock purchased will permit KNR to improve distribution and reduce the cost of its bulk handling operations. The electrification of the Jung Ang line directly under the project, the Seoul-Kuro, and Keumcheong-Sandong lines as a result of the project study, and the installation of the CTC on the Taebæag line has enabled KNR to increase the capacity of these sections, and as more of the network becomes electrified, will enable it to reduce its capital and maintenance costs by standardizing its locomotive fleet. Finally, this project has also played a significant role in increasing the operational efficiency of KNR.

Lessons Learned

5.02 Focus of Key Project Objectives. This was first and foremost a transport project and as such the focus was on the facilities and systems necessary to accommodate increased volumes of coal imports, and domestic production levels of both coal and cement. The ports and railway sub-sectors were the pivotal points for this activity. As the scope of the project changed, even before appraisal, the project became a multi-sector, multi-ministry endeavor, with a number of key elements impacting the movement of coal and cement and as a result the project itself. Key issues went far beyond transport. The government energy strategy for fuel consumption by the residential, commercial, industrial and public sectors as well as existing and forecast consumption patterns of these sectors both in the metropolitan and rural areas played a major role. Other significant factors were:

- (a) existing and forecast oil prices;
- (b) environmental policies associated with the use of coal, in particular related to populated areas;
- (c) the national coal distribution strategy, in particular the role of the railway sector in that strategy; and
- (e) the national coal importation strategy, including transshipment ports chosen to be focal points for coal importation, and secondary or feeder ports chosen to handle direct needs.

5.03 The complexities of the issues involved went far beyond the transport of coal involving, to a great extent, the price of oil. The transport components of the project became the facilitators for the government's energy policies. The one lesson most usefully learned is that the total socio-economic context of a project needs to be considered during project formulation. In this case energy, industrial, and environmental policies were as important as transport ones.

5.04 Government Commitment to Project. This project confirms a lesson that has already been learned many times; unless a project has the full support of all of the agencies involved, it is difficult for the project to be implemented successfully. This project was originally conceived by Bank staff as a means to address a problem that was believed to be pertinent, but due to various circumstances, it appears that the relevant government agencies did not completely support the project. The important lesson to remember is that if the project is to be successful it must have the full support of the Government.

5.05 Flexibility of Design. The downturn in oil prices and the agreement with Indonesia to import LNG led to an immediate reaction from the Government with respect to the volume of both coal importation and production. Re-examination of the concept of coal hub and feeder ports during the time of final design for the project ports also led to an immediate reaction from KMPA. All of this, coupled with the impact of progressively reduced levels of coal consumption in the metropolitan areas led to a re-assessment of the project scope, slightly over one year after project approval. The way in which the project was designed, with a number of components which were self-fulfilling on the one hand but intricately related to the whole project, on the other, allowed for massive changes in the project without negative impact. Less than six months after loan restructuring and component cancellation, the project was once again on track. Flexibility for change in the original design of the project allowed for a smooth conversion. The lesson learned is that projects need to be designed in such a manner as to allow for maximum flexibility. This case illustrates the need for continued close involvement of the staff during implementation.

5.06 Consideration of Local Competition in Project Cost Estimates. Bank policy is to prepare project cost estimates based on international prices in cases where ICB is contemplated for use. In Korea, strict adherence to this policy has resulted in significant cost savings not only in this project (about \$12 m) but also the Seoul-Busan Corridor and a number of other projects. The same is becoming true in Malaysia and other countries which have competitive industries. Project cost estimates are meant to reflect anticipated project costs. Inflated estimates result in large cancellations and an unnecessary penalty to the borrowing country in terms of overpayment in commitment charges before the situation is rectified. In the case of countries such as Korea, and increasingly others in Asia, local conditions need to be taken into consideration in the procurement process. The lesson here is that international costs are not necessarily reflective of project costs and more attention is necessary, in the case of countries with competitive industries, to take the local conditions into full consideration.

5.07 Complete Economic Analysis of Project Prior to Approval. With forecast increases in coal imports, the Government's original intention of having international coal ships going directly to the ports of Incheon and Ulsan was replaced with the plan of receiving larger ships at the ports of Kwang Yang and Pohang which would serve as coal receiving hubs, from which feeder vessels would then transport needed coal to the ports of Incheon and Ulsan. It was found, however, that the Pohang terminal would not accommodate commercial traffic other than that bound for the Pohang Steel Mill Company (POSCO). Ulsan, which is near Pohang on the east coast, thus became another

feeder port for coal originating at Kwang Yang. When the final design for the coal terminals was completed, however, and a revised economic analysis prepared, it was determined that a feeder system would not be feasible. With the subsequent drop in oil prices and re-assessment of coal traffic forecasts the Ulsan Port component was later dropped from the project altogether. A detailed project design had been carried out prior to appraisal however it did not include a review of the revised project concept. A final design incorporating a re-examination of the economic feasibility of the transportation concept was carried out only after project approval. The results of the project further support present Bank philosophy which encourages detailed designs and full economic analyses to be prepared before project approval.

5.08 Consideration of Potential Environmental Impact. Just outside the boundary of Incheon Port exists a complex of apartments built in 1978-1981, two years prior to project approval. Although permission to construct the coal terminal was granted by the National Environmental Planning Agency (NEPA), which satisfied itself that there would be no adverse environmental impact, the decision to grant building permission for the coal terminal appears to have been somewhat shortsighted. The citizens of the complex have become very vocal in their insistence for improved environmental control of the terminal. The lesson learned is the importance of appropriate site selection for environmentally damaging industries, in this case coal. It has become apparent that the quality of life, as in vast parts of the developed world, has become an important component of the Korean psyche.

5.09 Limit Emphasis on Cost Based Tariff Systems. The Bank continues to support and encourage governments to implement regular tariff increases and to introduce a cost based tariff system that enables an organization to recover the full cost of its operation. The problem with this policy has been in convincing the governments to implement such a policy in the face of public demands for cheaper rather than more expensive transportation services. This project failed to realize the agreed upon tariff increases, and the Bank has already learned the lesson that although tariff increases may be worthwhile objectives, they should not be given too much emphasis because of the difficulty that governments have in actually implementing such increases. The best way to help an organization increase its profitability and liquidity is to encourage the development of a marketing program which identifies the organization's strength and builds upon them. Product areas in which the organization cannot compete should be phased out. Adjustments in the tariff rates should support the marketing program and be combined with programs to reduce unit operating costs through the introduction of improved operating procedures and greater cost control. If such a program had been implemented as part of this project, the financial condition of KNR would be stronger today. KNR, like other railroads in the world, must realize that it can no longer be all things to all people. It must begin to focus on its markets and begin to emphasize those in which it has a natural advantage and cease to operate in those in which it does not. As the nation's railroad, KNR must continue to provide services that are in the country's interest even though they may not be commercially viable, but the government should compensate KNR for the full cost to provide those services and then provide direct subsidies to those sectors of the economy that need financial assistance.

VI. SUSTAINABILITY/REMAINING ISSUES

6.01 Notwithstanding the fact that the scope of the project was altered significantly with the re-appraisal in 1984 - the backdrop for continuous growth in coal imports at Incheon port and increasing productivity along the Taebaeg/Jung Ang Lines is questionable. As a result two issues remain to be addressed:

National Strategy for Diversified Use of Coal Facilities - The Case of Incheon Port

6.02 With significant declines in anthracite coal traffic since 1986, and gradual decreases in throughput of bituminous coal traffic in a number of secondary ports, including Incheon, a re-examination of the future of this coal facility is informally underway.

6.03 With the recent receipt of a request, from the Korea Oil Company, for permission to use the coal facility for the unloading of oil tankers, options for alternate uses of the facility are being considered. The present proposal calls for oil vessels to use the rear, or opposite side of the pier which is used by coal carriers. Preliminary investigations, however, indicate that the introduction of an appropriate fender system on that side plus the installation of an oil receiving facility underneath the pier could be prohibitively expensive. An alternative option, which investigates the possibility of using the coal receiving side of the pier is also under consideration. However, KMPA is dubious that permission would be granted for use of the coal receiving side as ship priority would have to be given to the coal carriers, in which case oil tankers could experience exorbitant and costly waiting times.

6.04 Whether or not an alternative or shared situation becomes necessary will depend on a number of factors, not the least being oil price variations, negotiated agreements with the Chinese to import coal, and the Korean energy strategy. Nonetheless, given present traffic volumes, an examination of alternate uses for the coal facility at the Port of Incheon along with similar examinations at other ports facing decreasing coal traffic, would be advisable. If the coal terminal at Incheon does end up sharing its facility with oil tankers this would indicate the ultimate in design flexibility, as the original objective for the coal pier was to relieve Korea of its dependence on oil.

Alternative Traffic for the Jung Ang Line

6.05 There was a two-year delay in the electrification of the Jung Ang line. This was due to local budgetary constraints as well as decreases in forecast coal traffic. Since then, except for the Yeongcheon-Yeongju section of the line, overall coal traffic on the whole of the electrified section (project section) has decreased (para. 4.08). The same is true of other freight as well as passenger traffic. On the other hand, traffic on the Taebaeg line has outstripped expectations. The anticipated diversion of traffic from the Taebaeg to the Jung Ang Line has not occurred and, if anything, there appears to be a reversed diversion to the Taebaeg line. This

judgement may be somewhat premature as the project sections were completed only in late December of 1988. Nonetheless, it would not be surprising to see the trend continue as the domestic coal mining region is located along the Taebaeg line and, with the installation of a Centralized Traffic Control System (CTC) system on that line, efficiency is expected to rise significantly. Furthermore, that section of the Jung Ang line which could act as a diversionary path presently has two railway systems, diesel and electrical. The dilemma needs to be resolved as quickly as possible. At the very least an aggressive marketing strategy should be developed. An alternative solution, if traffic can be justified, would be to electrify the connecting portion from the Taebaeg to the Jung Ang line.

VII. CONCLUSION

7.01 While the project yielded significant results as noted in para 5.01, its broader objective of helping Korea deal with rising costs of imported oil was affected by the complex and difficult global economy which ensued after appraisal. The world had recently been rocked by a second oil shock and oil prices were projected to escalate without reprieve. Korean reaction to the rising oil prices was no different than in any other country. There were a number of Bank projects in Asia which sought to alleviate the impact of rising oil prices. India, Indonesia, China, the Philippines, Nepal and Bangladesh all had petroleum exploration projects approved in 1982 and 1983, and both the Philippines and Indonesia sought funding for coal exploration projects in the same years. 1983 proved to be the pivotal point in energy strategy, particularly in Korea; oil prices had stabilized and in fact in mid-1983 began to fall; residential consumption of anthracite was declining and new construction was being encouraged to use alternate fuels; environmental policies against coal use in metropolitan areas was in place; the Government was in the process of negotiating an LNG deal with Indonesia; the feeder concept for coal transport was under reconsideration; the Government had decided to curtail the importation of anthracite after 1986 and; a second steel mill was being planned for construction at Kwang Yang Port, making that port the undisputed center for coal imports. Hindsight suggests that the project was premature, ready in fact only at the time of re-appraisal, but it would be foolish to suggest that all factors should have been known. In retrospect, 1982/83 was perhaps not the opportune time to appraise a project which focused so strongly on substitutes for oil import, in this case coal. It would not be surprising to find those energy projects noted as having been approved during this time frame yielding similar results.

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

I. CONDITIONS LEADING TO THE PROJECT

1.01 Due to Korea's limited domestic energy resources, most energy demand must be met by imports. This heavy dependence on imported fuel has made energy security one of the most challenging policy objectives for Korea.

1.02 The second oil shock, in early 1979, provided the spur for Korean energy policy to enforce all-out energy conservation measures and oil substitution through diversification of energy sources. As a result, new energy sources such as bituminous coal, nuclear energy and, LNG were introduced into the energy matrix.

1.03 With this policy of diversification, attention was drawn to the port receiving facilities for both anthracite and bituminous coal as well as the rail distribution system. Anthracite imports had jumped quite suddenly from 0.5 million tons in 1978 to 2.0 million tons in 1980, and no facilities were available to handle such large quantities, either from a receiving or distribution perspective. Furthermore, the increased volumes of bituminous coal, which were carried mainly by rail to the cement plants in the Jechon area, raised the issue of rail capacity.

1.04 At the same time there were projected increases in the production of cement due to continued increases in construction activity in both the industrial and urban sectors. The main issue in cement distribution centered on the relatively low proportion of bulk versus bagged transportation.

II. THE PROJECT

2.01 The objectives of the project were:

- (a) to provide the necessary capacity in rail, ports and inland terminals to efficiently handle the forecasted coal traffic through the 1980's, and
- (b) to address system inefficiencies in coal and cement distribution.

2.02 The scope of the project included:

- (a) specialized intermodal terminals in Bugog, to the south of Seoul and Seongbug to the northeast, both of which were designed to handle the projected increases in coal and cement. In Bugog cement silos were also to be introduced;
- (b) new coal receiving piers and coal terminals at both Incheon and Ulsan;

- (c) widening of the Su-In Line (53.2 km) from narrow to standard gauge together with the building of a 10 km section to reconnect this line to Incheon Port; electrification of a 65 km section of the Jung Ang Line and; installation of a Centralized Traffic Control (CTC) system on 126.8 km of the Taebaeg Line;
- (d) purchase of specialized cars for coal and cement transport.
- (e) policy measures regarding transport pricing of anthracite and bituminous coal and of bulk and bagged cement and; an increase in the proportion of bulk cement transported;
- (f) consulting services and personnel training; and
- (g) Seoul Metropolitan Region (Gyeonggi-do) Integrated Transport Study.

III. PROJECT HIGHLIGHTS

3.01 Project planning, forecasting and the resultant design of facilities was based on the premise of rising oil prices and continued importation of coal from distant corners of the globe, including Canada and Australia. However, in 1982/83 the retail price of petroleum products began to drop. In 1981 Bunker C, Propane and Butane prices had peaked. In 1982 the same occurred to Bunker A and B, followed in 1983 by Kerosene and Diesel fuel. At the same time international crude oil prices were peaking. In mid-1983 the approximate cost of one barrel of crude was US\$35, by the second half of that year it had dropped dramatically to US\$29.

3.02 This drop in oil prices and a parallel decision to use Kwang Yang Port as the main coal receiving terminal on the south coast and, Pohang Port on the east coast, with feeder service to Incheon and Ulsan Ports dropped, dramatically impacted the scope of the project. Coal forecasts were altered downward to reflect this policy change and it was concluded that a massive changeover to coal, and subsequent expansion of terminals was unwarranted. As a result the IBRD loan was restructured and certain components cancelled. These included construction of the coal pier and coal terminal facility at Ulsan, widening of the Su-In Line and the construction of the Seongbug intermodal facility. Furthermore, the electrification of the Jung Ang Line and introduction of a signalling system on the Taebaeg Line were postponed by two years.

IV. ASSESSMENT OF BANK PERFORMANCE

4.01 Co-ordination and co-operation between the IBRD and the executing agencies, the Korean National Railroad (KNR) and the Korea Maritime and Port Administration (KMPA), was generally good throughout the project period. The only problems which surfaced were on the financial side and were considered to be more irritations than real problems. The first concerns the Special Account Facility provided by the IBRD to facilitate fund transfers. Discrepancies between IBRD notifications and statements from the Korean

Exchange Bank, and the inconvenience of having the contractor submit invoices to the executing agency which then forwards these invoices to IBRD, has proven to be an additional administrative burden and an inconvenient extra step in the payment system. As a result, in the future the option to utilize the Special Account Facility would be reconsidered. The second problem which has arisen is with the IBRD's Currency Pooling System and in particular, again, discrepancies between IBRD notifications and statements from the Korean Exchange Bank.

4.02 In light of government policy decisions with respect to a decrease in forecasted levels of both anthracite and bituminous coal, the IBRD proved to be very understanding of the need for changes in project scope and funding requirements and, acted quickly in response to the government's request for restructuring of the loan and cancellation of excess funds.

V. ASSESSMENT OF INSTITUTIONAL PERFORMANCE

5.01 Overall performance of both KNR and KMPA was good, with project implementation proceeding more or less according to schedule. The only implementation problem arose in conjunction with the Incheon component and concerned certain incompatibility of detailed civil works and equipment design. This was due mainly to the fact that the design for civil works was prepared approximately six years before final detailed equipment design. As a result the civil designs did not allow for a sufficient quantity of equipment. Furthermore, specifications had changed since the time of preliminary design.

5.02 The KNR and KMPA components were distinct and separate. As such there was little need to maintain a constant dialogue. The two organizations, therefore, pursued implementation of the project separately except at the time of project restructuring. At that time there was a fair amount of interplay between the two organizations, in particular as forecasts of decreased volumes of coal import through Incheon Port directly impacted the Su-In Line component of the project.

5.03 The Project Co-ordinating Committee, which was chaired by the Ministry of Transport (MOT), held a number of meetings with both KNR and KMPA. The meetings were held on an as need basis. Again, during project restructuring these meetings were held more frequently.

VI. LESSONS LEARNED

A. KNR

Jung Ang Line Electrification

6.01 There was a two year delay in the electrification of the Jung Ang Line. This was due mainly to modification of the government's five year plan and decreases in forecasted coal traffic. In the interim, the coal traffic has been replaced by other bulk traffic. The decision to postpone

electrification has proven to be a wise one as traffic volumes have remained relatively stable throughout the project implementation period and are only now beginning to escalate.

6.02 Although the project budgeted for the electrification of only a portion of the Line, KNR believes that further electrification is warranted in order to allow for necessary traffic diversion from the Taebaeg Line, relieving a costly transport bottleneck in that Line. Completing only a small section of the diversion path has not yielded the anticipated results. For this reason KNR is budgeting for an extension of this electrification to cover the remaining portion.

Taebaeg Line Signalling

6.03 Although it was envisioned that coal transport from the Taebaeg production area would be split between the Jung Ang and the Taebaeg Line after project completion, even though the Jung Ang Line is a more circuitous route, this has not been the case. Instead of splitting between the two lines there actually appears to have been a diversion of coal to the Taebaeg Line. On the other hand, the Jung Ang Line has attracted some of the other freight traffic previously hauled by the Taebaeg Line.

6.04 The CTS system has been in place since June of 1988 and is working very well. The planning and design of the system has been particularly good and the system especially relevant. Although all training has been completed, the system is still under warranty. During the remaining warranty period it is anticipated that any outstanding operational issues will be satisfactorily addressed.

B. KMPA

Environmental Impact

6.05 Just outside the port grounds next to the coal terminal is a complex of apartment buildings. Construction on these apartments was begun a couple of years before construction on the coal terminal. Through this project it has become apparent that the selection of an appropriate site for coal terminals is very important. Although the National Environmental Planning Authority (NEPA) inspected the Incheon site prior to construction, and satisfied themselves that the prevailing wind, which is northwest, would carry the irritating dust particles away from the apartment complex, the decision to grant building permission for the coal terminal appears to have been somewhat shortsighted. The citizens of the complex have become very vocal in their insistence for improved environmental control of the coal terminal.

Programable Logic Control System

6.06 The computer system installed for the coal terminal is a highly sophisticated system from France. Learning the system has proved to be more difficult than originally anticipated. To accommodate more training Clansy extended the training period at their own expense. With the warranty in place it is anticipated that any unforeseen irregularities in the system will be

addressed and domestic familiarity with the system completed by the end of the warranty period.

Equipment Facilities

6.07 The unloading capacity of the coal terminal facility at Incheon is 1,000 tons/hr. However, the stacking and reclaiming capacity is less than that. Although stacking can be done simultaneously with unloading, reclamation cannot be carried out due to equipment constraints. The original plan and design called for two stacking and reclaiming facilities but due to budgetary constraints, funds for only one facility were provided. This has proven to be both inconvenient and a less efficient alternative.

VII. REMAINING ISSUES

Environmental Control

7.01 The remaining issue with respect to environmental control at the coal terminal in Incheon is how best to cope with the existing citizens action group. There is already a sprinkler system in place and a net around the area to offset dust particles which emanate from the coal. However the citizens group is not satisfied with the result. The residents are insisting on the construction of a secondary fence around their apartment complex to further address the air and noise pollution problems. At present the coal facility is operated on a three shift, 24 hour schedule. In the future it may be necessary to temper this activity. KMPA has been vested with the responsibility of addressing any environmental concerns respective the coal facility at Incheon. As such it is expected that any additional controls considered necessary for environmental protection reasons will be implemented.

Augmentation of Coal Reclaiming Equipment

7.02 The Economic Planning Board (EPB) has been approached for funding of the additional reclaiming facility. Approval has not as yet been received.

Alternate Uses of the Coal Pier

7.03 Recently a private oil company has presented a request to the Incheon Port Authority for use of the coal pier facility. At this time permission has been granted but there is uncertainty as to whether or not oil tankers can be accommodated at the facility.

7.04 Originally it was proposed that the oil tankers would make use of the rear, or opposite side of the coal pier, but on closer examination it was determined that the introduction of an appropriate fender system on that side, plus the installation of an oil receiving facility underneath the pier would be very expensive. Subsequently, a request has been filed to accommodate oil tanker berthing on the coal receiving side. This may prove difficult because although the number of coal ship calls per month can be established well in advance, the specific arrival dates cannot be set more than a day or more before ship arrival. This would be true also of the oil tankers. The result

could be simultaneous arrival of coal ships and oil tankers. As priority would be given to the coal ship, and the oil vessel would not be free to use other oil facilities at Incheon, waiting time could be extensive. For this reason a final decision on an appropriate alternate use of the coal facility has not as yet been made and will not be done until such time as all relevant options are explored.

KOREA

PORT FACILITIES IN KWANG YANG PORT

		Quay-wall berthing capacity	Loading & unloading equipment	Handling capacity	Completion year
Import raw materials Bulk terminal	Present	30,000 x 1	2,000 T/H		
		5,000 x 2	600 T/H		
		160,000 x 1	2,000/T/H	21,168/year	07/13/87
		250,000 x 1			
		160,000 x 1			10/31/88
	Future	250,000 x 1	2,000 T/H		09/88-08/90
		160,000 x 1		18,507/year	04/90-12/94
		100,000 x 1	700 T/H		
50,000 x 1					
Product export terminal	Present	30,000 x 1	30 B.T.C.		11/16/85
		30,000 x 1	35 B.T.C.		03/02/88
		30,000 x 1	30 L.L.C.	3,725/year	03/02/88
		20,000 x 1	30 B.T.C x 2		11/24/88
		5,000 x 1	30 L.L.C. x 1		11/24/88
	Future	5,000 x 5	35 B.T.C. x 2	1,118/year	07/88-12/90
		50,000 x 1	40 B.T.C. x 1		04/90-12/94
Administration wharf	Present	3,000 x 2			10/06/88
		1,000 x 1			
Total	Present	14	13	24,898/year	
	Future	10	7	14,625/year	

Source: KMPA April 1989

KOREA
KNR OPERATING STATISTICS

	1982	1983	1984	1985	1986	1987	1988
System							
Total route (km)	3,121	3,117	3,117	3,114	3,114	3,130	3,149
Total staff	40,431	39,367	38,558	37,498	37,629	37,195	37,470
Operations staff	34,379	33,588	33,151	33,063	32,922	32,754	35,870
Other	6,052	5,771	5,406	4,434	4,707	4,441	1,600
Traffic							
Passenger-total (million)	443.5	489.4	489.0	503.2	518.9	525	564.2
Metropolitan ^{/a}	282	315.7	341.9	367.2	374.9	385	422.9
Nonmetropolitan	161.5	153.7	147.1	146.0	144.0	140	141.3
Pass-km-total (million)	21,034	21,688	21,884	22,595	23,562	24,457	25,970
Average journey (km)	47.4	48.2	44.8	44.9	45.4	48.6	46.0
Net paying tons (million)	47.4	50.5	53.7	55.3	58.2	59.3	60.7
Net paying ton-km (million)	10,892	11,629	12,033	12,296	12,813	13,061	13,784
Average haul (km)	229.8	230.3	244.1	222.4	220.2	220.3	227.1
Rolling stocks-km for freight							
car km (million)	431	463	488	503	527	529	541
Loaded freight car km (million) ^{/b}	263	281	293	297	317	321	336
Empty freight car km (million)	168	182	195	206	210	208	205
Traffic Density							
Pass-km/route km ('000)	6,740	6,958	7,021	7,220	7,568	7,614	8,247
Freight-net ton-km/route km ('000)	3,490	3,731	3,860	3,949	4,115	4,173	4,377
Operations							
Train-km-passenger ('000)	47,632	48,637	50,131	53,077	56,855	58,575	58,315
Train-km-freight ('000)	21,561	22,839	24,576	25,442	25,742	26,760	27,983
Train-km-total ('000)	69,193	71,477	74,707	78,519	82,597	85,335	86,298
Loco-km-diesel ('000) ^{/c}	61,240	64,184	67,543	68,968	72,184	74,778	76,068
Loco-km-electric ('000)	9,279	9,689	9,989	10,073	10,469	10,424	10,895
Operating Efficiency (freight)							
Net-ton-km/train-km	0.51	0.51	0.49	0.48	0.50	0.49	0.49
Net-ton-km/loaded car-km	41.4	41.4	41.1	41.4	41.3	40.7	41.0
Car turnaround time (days)	4.94	4.76	4.56	4.38	4.09	4.03	3.90
Traffic units/employee ('000)	789.6	846.5	879.7	930.5	966.7	1,008.7	1,061.2
Availability							
Diesel locomotives (%)	91.2	89.7	90.2	89.8	88.0	88.7	88.6
Electric locomotives (%)	89.4	84.4	85.6	86.7	87.7	87.9	88.2
Freight cars (%)	94.2	94.8	95.3	96.4	96.6	96.6	96.4
Passenger cars (%)	92.8	92.7	93.0	94.9	93.8	93.6	94.8

^{/a} Seoul suburban traffic.

^{/b} Including Cabees.

^{/c} Excluding shunting.

KOREA
KNR FREIGHT AND PASSENGER TRAFFIC

(Unit: million ton
million ton-km)

	1982		1983		1984		1985		1986		1987		1988	
	Tons	Ton-km	Tons	Ton-km	Tons	Ton-km	Tons	Ton-km	Tons	Ton-km	Tons	Ton-km	Tons	Ton-km
Major commodities														
Coal	19.6	4,220	20.1	4,413	23.2	4,797	24.4	5,011	26.7	5,357	25.7	5,038	25.2	5,093
Cement	9.5	2,069	11.1	2,366	10.9	2,339	11.2	2,441	11.9	2,515	12.4	2,647	13.1	2,837
Ore	3.9	960	4.1	997	4.3	1,062	4.3	1,082	3.9	968	4.2	1,081	4.6	1,255
Fertilizer	1.8	503	1.6	458	1.6	468	1.6	446	1.6	473	1.8	515	1.9	531
Grain	0.7	216	0.8	256	0.7	232	0.6	201	0.4	139	0.3	84	0.3	93
Subtotal	38.1	8,558	40.3	9,085	43	9,541	45.3	9,870	47.6	10,194	48.1	10,218	49.2	10,790
Others														
General cargo	5.8	1,487	6.4	1,678	6.2	1,590	5.7	1,457	5.9	1,479	5.9	1,484	5.9	1,502
Container	0.6	218	0.8	328	0.8	347	0.9	365	1.5	608	2.0	817	2.4	990
Military	1.4	395	1.4	365	1.4	367	1.4	394	1.4	376	1.4	373	1.3	353
KNR	1.5	171	1.6	173	1.7	188	2.0	210	1.6	156	1.9	169	1.9	149
Subtotal	9.2	2,334	10.2	2,544	10.1	2,492	10.0	2,426	10.4	2,619	11.2	2,843	11.5	2,994
Total	47.4	10,892	50.5	11,629	53.7	12,033	55.3	12,296	58.2	12,813	59.3	13,061	60.7	13,784

Source: KNR April 1989

KOREA
KNR FREIGHT AND PASSENGER TRAFFIC

(Unit: million pass.)
million km

	1982		1983		1984		1985		1986		1987		1988	
	No. of pass.	Pass. km	No. of pass.	Pass. km	No. of pass.	Pass. km	No. of pass.	Pass. km	No. of pass.	Pass. km	No. of pass.	Pass. km	No. of pass.	Pass. km
Intercity Traffic														
Commuter	17.0	405	16.8	400	14.6	375	13.5	365	12.8	337	11.4	319	10	288
Long distance	142.8	15,051	133.4	15,363	131.1	15,190	131.2	15,889	130.5	16,092	127.4	17,503	130.1	16,529
Military	1.2	382	1.0	310	1.4	398	1.3	363	1.2	349	1.2	348	1.2	335
Total	161.5	15,838	153.7	16,073	147.1	15,861	146.0	16,616	144.0	17,378	140	18,170	141.3	19,152
Long Distance Intercity Traffic by Type of Service														
Special express	1.9	641	1.9	607	1.8	569	2.1	636	2.7	893	4.1	1,333	5.3	1,711
A/C Ltd express	9.7	2,210	10.8	2,536	13.1	3,070	17.0	3,701	22.9	4,779	27.1	5,556	30.3	6,314
Limited express	33.4	6,934	37.8	7,680	40.7	7,948	42.5	8,290	43.1	8,263	43.6	8,215	45.2	8,387
Ordinary trains	63.8	5,216	65.9	4,490	75.4	5,583	69.6	3,221	61.8	2,767	52.6	2,599	48.6	2,117
Total	108.8	15,051	136.4	15,363	131.1	15,190	131.2	15,888	130.5	16,092	127.4	17,503	130.1	16,529
Seoul Urban (SMESRS) Traffic														
Commuter	64.8	1,231	73.0	1,423	67.6	1,536	67.7	1,629	117.9	1,911	121.9	1,923	139.6	2,179
Noncommuter	217.4	3,965	237.7	4,189	254.3	4,385	259.5	4,350	257.0	4,273	263.1	4,363	263.4	4,646
Total	282.0	5,196	315.7	5,615	341.9	5,923	367.2	5,979	374.9	6,184	385	6,287	423	6,827

Source: KNR April 1989

KOREA
PORT AUTHORITY OF INCHEON
BALANCE SHEET AS OF DECEMBER 31

(million won)

Assests and Liabilities	<u>83</u> Actual	<u>84</u> Actual	<u>85</u> Actual	<u>86</u> Actual	<u>87</u> Actual
<u>Assets</u>					
I. <u>Current Assets</u>					
Deposit	-	-	-	1,111	2,179
Accounts receivable	265	515	560	621	989
Inventories	-	101	340	155	155
Other current assets	60	105	47	303	444
Total current assets	325	721	947	2,190	3,767
II. <u>Investments and Other Assets</u>	8	9	9	9	9
III. <u>Properties</u>					
Land	36,712	39,055	65,091	68,271	68,378
Buildings	6,303	6,553	7,689	11,794	11,784
Structures	39,585	41,830	76,373	84,456	85,314
Machinery and equipment	-	46	447	7,681	7,668
Vessels	1,230	1,239	1,722	1,820	1,820
Construction in progress and others	49,164	68,749	62,806	69,036	83,845
Total	132,994	157,472	214,128	243,058	258,809
Less accumulated depreciation	(5,422)	(7,091)	(2,647)	(6,028)	(11,447)
Properties - net	127,572	150,381	211,481	237,030	247,362
Total assets	127,905	151,111	212,437	239,229	251,138
IV. <u>Current Liabilities</u>	5,691	759	698	1,794	777
Accounts payable	5,691	759	698	1,794	777
Current maturities of long-term debt	4,718	968	1,900	1,902	2,215
Temporary deposit	-	-	-	11	1
Total current liabilities	10,409	1,727	2,598	3,707	2,993
Long-term debt	50,961	18,564	35,063	41,910	50,434
Total liabilities	61,370	20,291	37,661	45,617	53,427
Headquarters control account	66,535	130,820	174,776	193,612	197,711
Total liabilities equity	127,905	151,111	212,437	239,229	251,138

Source: KMPA April 1989

Table 4B

KOREA
PORT AUTHORITY OF INCHEON
INCOME STATEMENT FOR THE TWELVE MONTHS ENDING DECEMBER 31

(million won)

Item	<u>83</u> Actual	<u>84</u> Actual	<u>85</u> Actual	<u>86</u> Actual	<u>87</u> Actual
I. <u>Operating Revenue</u>					
Revenue from port facilities	12,155	12,059	13,673	16,325	18,787
Revenue from equipment	185	30	4	2	-
Rentals	-	802	1,027	1,251	2,308
Others	873	770	776	725	1,065
Total	<u>13,661</u>	<u>13,661</u>	<u>15,480</u>	<u>18,303</u>	<u>22,160</u>
II. <u>Costs and Expenses</u>					
Employee services	1,644	1,606	1,822	1,801	1,904
Repairs and maintenance	2,579	2,074	696	1,093	1,154
Depreciation	1,260	1,587	2,463	3,337	5,925
General administrative expenses	457	624	925	1,352	1,887
Total	<u>5,940</u>	<u>5,891</u>	<u>5,906</u>	<u>7,583</u>	<u>10,870</u>
III. <u>Net Operating Income</u>	7,273	7,770	9,574	10,720	11,290
IV. <u>Other Income</u>					
Miscellaneous	-	1,437	-	199	363
V. <u>Other Expenses</u>					
Interest expense	1,148	1,454	2,124	3,411	3,920
Foreign exchange losses	2,966	-	7,914	8,385	8,043
Subsidies for shipping companies	406	627	857	1,112	1,043
School operating expenses	-	-	-	-	-
Others	162	30	3	-	-
Total	<u>4,682</u>	<u>2,111</u>	<u>10,898</u>	<u>12,908</u>	<u>13,006</u>
VI. <u>Normal Income (Loss)</u>	2,591	7,096	(1,324)	(1,989)	(1,353)
VII. <u>Special Gain (Loss)</u>					
Gain in disposal of properties	-	-	7	-	-
Loss on disposal of properties	(9)	(57)	(98)	(111)	(51)
VIII. <u>Net Income (Loss)</u>	2,582	7,039	(1,415)	(2,100)	(1,404)

Source: KMPA April 1989

Cement Traffic*

(a) Rail Traffic for Cement

(Unit: 1,000 ton)

1980	Bag Cement	Bulk Cement
1980	5,136	3,012
1981	4,564	2,667
1982	5,081	3,185
1983	6,199	3,431
1984	5,664	3,806
1985	4,994	4,640
1986	4,648	5,601

(b) Cement Freight Tariff System

1. The differential tariff system between bag and bulk cement has not be implemented. KNR's view of point is that before implementing such a differential tariff system, the operating ratio of cement freight should be further improved and silos at stations should be expanded enough to smoothly handle the increased bulk cement traffic in future.

2. In view of the operating ratio of cement (98.4 in 1986) it will be difficult at present for KNR to implement the differential tariff system by lowering the price of bulk cement freight.

3. Therefore, KNR would like to wait for circumstances to be changed more favorably in view of the operating ratio of cement, silo capacity at stations, and bulk cement traffic trend.

4. With these in mind KNR has encouraged the customers to install silos at railway stations.

* December 1/87

KOREA

PROJECT COMPLETION REPORT

COAL AND CEMENT DISTRIBUTION PROJECT LOAN 2267-KO

PART III: STATISTICAL INFORMATION

KOREA

Coal and Cement Distribution Project (Loan 2267-K0)

Appraisal vs Actual Detailed Project Cost
(million won)

	Appraisal			Actual			Actual as % of Appraisal
	Local	Foreign 1983-86	Total	Local	Foreign 1983-88	Total	
Railway Investments							
Electrification, 64 km	11,879	9,046	20,925	15,733	6,369	22,102	105.6%
Signalling, 126.8 km	5,165	11,833	16,998	8,023	4,016	12,041	70.8%
Gauge Widening, 53.2 km	61,656	23,505	85,161	0	0	0	0.0%
Cement Tank Cars, 320	2,225	14,103	16,328	39	6,712	6,751	41.3%
Special Coal Cars, 261	1,664	11,301	12,965	33	6,407	6,440	49.7%
Maintenance Equipment	910	4,824	5,734	433	11,811	12,244	213.5%
Subtotal Railways	83,499	74,612	158,111	24,263	35,315	59,578	37.7%
Intermodal Terminal							
Bugog	39,643	19,136	58,779	19,332	562	19,694	33.8%
Seongbug	3,053	994	4,047	3,068	0	3,068	75.8%
Subtotal Terminals	42,696	20,130	62,826	22,400	562	22,962	36.5%
Port Coal Terminals							
Incheon - Civil Works	20,269	20,269	40,538	50,956	0	50,956	125.7%
Equipment	2,172	24,978	27,150	1,463	8,528	9,991	36.8%
Subtotal Incheon	22,441	45,247	67,688	52,419	8,528	60,947	90.0%
Ulsan - Civil Works	3,247	3,247	6,494	0	0	0	0.0%
Equipment	1,072	12,302	13,374	0	0	0	0.0%
Subtotal Ulsan	4,319	15,549	19,868	0	0	0	0.0%
Subtotal Ports	26,760	60,796	87,556	52,419	8,528	60,947	69.6%
Study							
Gyeonggi-do	0	447	447	0	199	199	44.5%
Overseas Training	0	0	0	0	91	91	NA
Subtotal Study	0	447	447	0	289	289	64.7%
Technical Assistance							
Port Procurement	73	170	243	197	409	606	249.5%
Port Training	0	43	43				NA
Subtotal TA	73	213	286	197	409	506	212.0%
Total	153,028	156,198	309,226	99,279	45,103	144,382	46.7%
Physical Contingencies	2,987	2,051	5,038	0	0	0	0.0%
Price Contingencies	20,937	21,739	42,676	0	0	0	0.0%
Baseline Cost Estimate	156,015	158,249	314,264	99,279	45,103	144,382	45.9%
Front-End Fee	0	0	0	0	229	229	NA
GRAND TOTAL	176,952	179,988	356,940	99,279	45,332	144,611	40.5%

Source: SAR, KMPA, and KNR Statistics

KOREA

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Coal and Cement Distribution Project (Loan 2267-K0)

Appraisal vs Actual Detailed Project Cost
(US\$ Thousand)

	Appraisal			Actual			Actual as % of Appraisal
	Local	Foreign 1983-86	Total	Local	Foreign 1983-88	Total	

Railway Investments							
Electrification, 64 km	15,945	12,142	28,087	19,316	7,398	26,714	95.1%
Signalling, 126.8 km	6,933	15,883	22,816	9,368	4,686	14,054	61.6%
Gauge Widening, 53.2 km	82,760	31,550	114,310	0	0	0	0.0%
Cement Tank Cars, 320	2,987	18,930	21,917	46	7,984	8,030	36.6%
Special Coal Cars, 261	2,234	15,169	17,403	40	7,728	7,768	44.6%
Maintenance Equipment	1,221	6,475	7,696	502	13,681	14,183	184.3%
Subtotal Railways	112,080	100,149	212,229	29,272	41,477	70,749	33.3%

Intermodal Terminal							
Bugog	53,212	25,686	78,898	24,612	678	25,290	32.1%
Seongbug	4,098	1,334	5,432	3,831	0	3,831	70.5%
Subtotal Terminals	57,310	27,020	84,330	28,443	678	29,121	34.5%

Port Coal Terminals							
Incheon - Civil Works	27,207	27,207	54,414	63,468	0	63,468	116.6%
Equipment	2,917	33,526	36,443	1,895	10,831	12,726	34.9%
Subtotal Incheon	30,124	60,733	90,857	65,363	10,831	76,194	83.9%

Ulsan - Civil Works	4,358	4,358	8,716	0	0	0	0.0%
Equipment	1,437	16,514	17,951	0	0	0	0.0%
Subtotal Ulsan	5,795	20,872	26,667	0	0	0	0.0%

Subtotal Ports	35,919	81,605	117,524	65,363	10,831	76,194	64.8%

Study							
Gyeonggi-do	0	600	600	0	238	238	39.7%
Overseas Training	0	0	0	0	103	103	NA
Subtotal Study	0	600	600	0	341	341	56.8%

Technical Assistance							
Port Procurement	98	228	326	246	497	743	227.9%
Port Training	0	58	58	0	0	0	0.0%
Subtotal TA	98	286	384	246	497	743	193.5%

Total	205,407	209,660	415,067	123,324	53,824	177,148	42.7%
=====							
Physical Contingencies	4,009	2,752	6,761	0	0	0	0.0%
Price Contingencies	28,103	29,180	57,283	0	0	0	0.0%
Baseline Cost Estimate	209,416	212,612	421,828	123,324	53,824	177,148	42.0%
Front-End Fee	0	0	0	0	302	302	NA
=====							
GRAND TOTAL	237,519	241,592	479,111	123,324	54,127	177,450	37.0%
=====							

Source: SAR, KCPA, and KNR Statistics

KOREA

Coal and Cement Distribution Project (Loan 2267-KO)

Loan Disbursements

A. Cumulative Estimated and Actual Disbursements
(US\$ million equivalent)

Semester Ending	Appraisal Estimate	Actual	Actual as % of Estimate	Actual as % of Total
December 31, 1983	2.4	0.3	12.5%	0.6%
June 30, 1984	8.6	0.3	3.8%	0.6%
December 31, 1984	17.7	10.8	61.2%	20.1%
June 30, 1985	30.9	23.5	76.2%	43.6%
December 31, 1985	54.5	30.0	55.1%	55.5%
June 30, 1986	74.6	30.9	41.4%	57.2%
December 31, 1986	98.2	30.9	31.5%	57.2%
June 30, 1987	114.1	46.2	40.5%	85.4%
December 31, 1987	122.0	50.9	41.7%	94.2%
June 30, 1988		52.4	43.0%	97.0%
December 31, 1988		54.0	44.3%	100.0%
June 30, 1989		54.0	44.3%	100.0%

NOTE: The last disbursement was made on July 25, 1989 and the undisbursed balance of US\$ 421,454 was cancelled effective July 25, 1989 and the loan account closed.

KORFA

Coal and Cement Distribution Project (Loan 2267-KO)

Loan Disbursements

B. Loan Distribution by Category
(US\$ equivalent)

Category	Appraisal			Actual	
	Loan Allocation	% To Be Financed	% of Loan	Loan Disbursed	% of Loan
Equipment & Materials for Part A of the Project	75,064,000	100% of foreign and 100% of local (ex-fact)	61.5%	41,684,428	77.2%
Rails, Timber and Cranes for Part B (i) of the Project	8,191,000	100% of foreign and 100% of local (ex-fact)	6.7%	677,841	1.3%
Coal Handling Equipment for Parts C (iv) of the Project	23,219,000	100% of foreign and 100% of local (ex-fact)	19.0%	10,627,381	19.7%
Studies for the Part E of the Project	600,000	100%	0.5%	439,397	.8%
Technical Assistance and Overseas Training for Part F of the Project	286,000	100%	0.2%	342,337	.6%
Front-End Fee	304,239	Amount due under Section 2.05 of Loan Agreement	0.2%	304,239	.5%
Net Foreign Exchange Fluctuations from Special Accounts				(47,077)	(.1%)
Unallocated	14,335,761		11.8%	0	
Total	122,000,000		100.0%	54,028,547	100.0%

KOREA
Coal and Cement Distribution Project (2267-K0)

List of Equipment Procured
(Unit: Thousand \$)

	Number of Units			Contractor	Contract Period		Cost			Remarks
	Origin	Revised	Actual		Date of Contract	Date of Expiry	Original	Revised	Actual	
I. Equipment										
a. Equipment for Electrification of Jung-ang Line (64km)				Goldstar Instrument and 16 companies	06/19/86	11/24/87	9,093	7,874	7,393	
b. Equipment for Sinalling to Taebaeg Line (126.8km)				Mistui & Co. Ltd. and Missin Electric Co.	07/11/85	10/10/87	12,083	4,625	4,686	Maintenance fee of 14,680,000 will be withdrawn at the end of June 1989.
c. Cement Tank Cars	320ea	222ea	241 ea	Ssang-Yong Corp. and Samsung Co., Ltd.	07/09/84	05/04/87	18,925	7,891	7,784	
d. Gondola cars	261ea	261ea	261ea	Samsung Co., Ltd.	11/22/84	07/29/85	15,164	7,728	7,728	
e. Equipment for Brodeing Su-In Line										
- Rails 50kg/m	9,700ton	---	---				5,969	---	---	Cancelled
- Timber Ties	160,900ea	---	---				7,080	---	---	Cancelled
- Signalling							530	---	---	Cancelled
SUBTOTAL							13,579	---	---	
f. Maintenance	62ea	78ea	78ea	Daedong Commercial Industry Co., Ltd. and 3 companies	07/11/84	06/10/87	6,220	12,422	13,681	
g. Equipment for Bugog Terminal										
- Rails, 50kg/m	4,200ton	---	---				2,613	---	---	Cancelled
- Timber Ties	100,000ea	---	---				4,359	---	---	Cancelled
- Transtainer cranes	2 ea	2 ea	1 ea	Korea Heavy Industries and Construction Co.	06/08/84	06/25/85	1,219	678	678	
TOTAL EQUIPMENT							83,225	42,553	42,155	
II. Contingencies										
- Physical contingencies							1,731	---	---	
- Price contingencies							12,605	---	---	
III. Studies and Training										
- Kyonggi Region Multimodal Transport Feasibility Study				Becom (France) KRISH, KECC, YOOSHIN (Korea)	12/24/84	12/06/85	---	150	103	
- Training							---	238	238	
IV. Front-End Fee							---	244	244	
TOTAL							97,591	42,985	42,740	

KOREA

COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)

 Korean National Railroad (KNR)
 Summarized Income Statements and Balance Sheets
 (won billion)

	1982		1983		1984		1985		1986		1987		1988	
	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast
INCOME STATEMENT														
Gross Operating Revenue	417.3	404.6	470.9	471.0	514.0	546.2	551.2	614.4	592.2	684.8	626.2	709.6	672.2	862.8
Working expenses	382.1	357.5	417.9	379.3	440.7	410.7	459.6	445.6	479.1	479.7	508.9	515.6	559.3	564.4
Depreciation	51.0	46.2	(58.0)	51.0	65.0	56.7	70.9	63.1	84.0	70.4	84.5	75.0	88.9	81.0
Net Operating Revenue	(15.8)	0.9	(5.0)	40.7	8.3	78.8	20.7	105.7	29.1	134.7	32.8	179.0	24.0	212.4
Net non-operating revenue	10.9	3.0	5.9	3.0	4.8	3.1	19.5	3.2	0.9	3.3	9.7	3.5	9.4	4.0
Interest charges	69.9	80.6	72.5	92.0	80.4	104.1	63.3	117.0	66.8	125.5	71.2	136.9	70.7	156.7
Net Profit (Loss)	(74.8)	(76.0)	(71.6)	54.3	(67.3)	22.2	23.1	8.1	36.8	12.5	28.7	45.6	37.3	59.7
Ratios (%)														
Working	91.6	88.0	88.7	81.0	85.7	75.0	83.4	73.0	80.9	68.0	81.3	67.0	83.2	66.0
Operating	103.8	100.0	101.1	91.0	98.4	86.0	96.2	83.0	95.1	80.0	94.8	77.0	96.4	75.0
BALANCE SHEET														
Assets														
Working capital	(64.0)	(92.6)	(56.8)	(88.1)	(88.0)	(81.1)	123.4	9.1	(123.6)	0.0	(188.2)	(45.9)	(198.8)	(94.7)
Net fixed assets	2,197.4	2,105.4	2,402.6	2,318.6	2,490.1	2,553.3	(2,839.2)	(2,814.1)	3,042.2	3,097.5	3,250.4	3,390.4	3,629.0	3,721.3
Other assets	67.9	70.1	64.2	70.1	36.5	70.1	119.8	70.1	162.5	70.1	226.0	75.1	171.9	77.0
Total Assets	2,201.3	2,082.9	2,410.0	2,300.6	2,438.6	2,542.3	2,835.6	2,875.1	3,081.1	3,167.6	3,288.2	3,511.0	3,602.1	3,893.0
Liabilities														
Long-term debt	842.1	844.4	926.3	988.8	919.7	1,084.5	1,042.4	1,220.3	1,166.0	1,308.0	1,270.3	1,463.8	1,268.3	1,620.9
Equity equivalent	1,359.2	1,238.5	1,483.7	1,311.8	1,520.9	457.8	1,793.2	1,004.4	1,915.1	1,859.6	2,017.9	2,047.5	2,133.8	2,272.1
Total liabilities	2,201.3	2,082.9	2,410.0	2,300.6	2,438.6	2,542.3	2,835.6	2,875.1	3,081.1	3,167.6	3,288.2	3,511.3	3,402.1	3,893.0

Source: KNR Statistics

KOREA
 COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)
 Korean National Railroad (KNR)
 Sources and Applications of Funds 1982-1987
 (won billion)

	1982		1983		1984		1985		1986		1987	
	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast
Sources												
Gross operating revenue	417.3	404.6	470.92	471.0	514.00	546.2	551.02	614.4	592.02	684.8	626.02	769.6
Working expenses	381.8	357.5	417.65	379.3	439.42	410.7	456.21	445.6	464.27	479.7	497.56	515.6
Cash generated from operations	35.5	47.1	53.27	91.7	74.58	135.5	94.99	168.8	127.93	205.1	128.64	254.0
Borrowing												
Local	143.6	144.0	101.23	160.0	98.09	100.0	116.09	150.0	118.06	100.0	99.00	150.0
Foreign	25.9	34.0	19.52	24.2	8.23	34.7	16.63	83.2	18.83	85.3	24.97	68.0
Total	169.50	178.0	120.75	184.2	107.13	134.7	133.53	233.2	137.43	185.3	123.97	218.0
Subsidies												
Against investments	18.0	18.0	27.05	27.5	-	40.0	34.20	70.0	22.0	60.0	25.0	60.0
Against operating losses	34.8	34.8	35.40	35.4	55.50	65.0	12.80	65.0	30.0	50.0	25.0	-
Total	52.8	52.8	62.09	62.9	55.05	105.0	47.00	135.0	52.0	110.0	50.0	60.0
Provision for severance pay	4.09	3.0	3.17	3.0	2.87	3.5	3.40	3.5	2.14	4.0	2.77	4.5
Other non-operating revenue	11.04	3.0	6.34	3.0	4.51	3.1	19.55	3.2	0.96	3.3	9.81	3.5
Sale of assets	11.07	2.0	21.34	3.0	29.55	3.0	21.68	4.0	9.37	4.4	13.88	5.0
Total Sources	285.00	285.9	267.77	347.8	274.14	384.8	320.10	547.7	329.78	512.1	329.01	545.0
Applications												
Investments	155.90	176.1	144.19	208.5	124.69	231.2	208.53	257.8	192.21	275.9	243.44	300.0
Debt Service												
Interest	69.90	80.6	72.46	92.0	80.45	104.1	63.35	117.0	66.83	125.5	71.24	136.9
Repayment of principal	42.40	40.9	42.88	42.8	100.14	42.5	83.68	100.9	71.06	101.6	78.74	62.2
Total Debt Service	112.30	121.5	115.34	134.8	180.59	146.6	147.03	217.9	137.89	227.1	149.98	199.1
Total Applications	268.20	297.6	260.62	343.3	305.28	377.8	355.56	475.7	330.10	503.0	393.42	499.1
Annual variation in working capital	16.80	(11.7)	7.15	4.5	(31.14)	7.0	(35.45)	72.0	(0.32)	9.1	(64.41)	45.9
Working capital brought forward	(80.80)	(80.9)	(64.00)	(92.6)	(56.84)	(88.1)	(87.98)	(81.1)	(123.43)	(9.1)	(123.75)	-
Working capital at the end of year	(64.00)	(92.6)	(56.84)	(88.1)	(87.98)	(81.1)	(123.43)	(9.1)	(123.75)	-	(188.16)	45.9

Source: KNR Statistics

KOREA

Coal and Cement Distribution Project (Loan 2267-KO)

Taebaeg Line - Actual Freight and Passenger Traffic
(Traffic in the East-West Direction Only)

	1981	1982	1983	1984	1985	SAR Est. 1986	1986	1987	1989	----- 1990	Forecast 1991	----- 1992
Jecheon-Ssangyong Freight (million tons p.a.)												
Coal domestic	7.0	6.8	7.3	10.7	11.6	7.9	12.8	11.8	12.1	12.5	12.8	13.2
Cement Ssangyong	2.6	2.3	2.4	2.3	2.3	3.9	2.3	2.1	2.4	2.4	2.5	2.5
Cement from East Coast	0.9	0.9	1.4	1.8	2.0	1.3	2.1	2.2	2.4	2.6	2.8	3.0
Ore	0.7	0.9	0.9	1.3	1.5	0.9	1.3	1.7	2.0	2.2	2.5	2.8
Others	0.3	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0
Total	11.5	11.0	12.1	16.2	17.5	14.4	18.6	17.9	18.9	19.7	20.6	21.5
Passengers (million)	1.3	1.3	1.2	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2	1.2
Ssangyong-Yeongwol Freight (million tons p.a.)												
Coal domestic	7.0	6.9	7.3	10.7	11.6	7.9	12.8	11.8	12.1	12.4	12.8	13.3
Cement from East Coast	0.9	0.9	1.4	1.8	2.0	1.3	2.1	2.2	2.4	2.6	2.8	3.0
Ore	0.2	0.2	0.3	0.5	0.5	0.3	0.4	0.6	0.8	0.9	1.0	1.1
Others	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	8.2	8.1	9.1	13.1	14.2	9.6	15.4	14.7	15.4	16.0	16.7	17.5
Passengers (million)	1.3	1.3	1.2	1.2	1.2	1.6	1.2	1.2	1.2	1.2	1.2	1.2
Yeongwol-Jeungsan Freight (million tons p.a.)												
Coal domestic	7.3	7.1	7.4	10.9	11.7	8.2	12.8	12.2	12.4	12.8	13.2	13.6
Cement from East Coast	0.9	0.9	1.4	1.8	2.0	1.3	2.1	2.1	2.3	2.4	2.6	2.8
Ore	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.5	0.6	0.7
Others	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	8.5	8.2	9.0	13.0	14.0	9.9	15.2	14.7	15.2	15.8	16.5	17.2
Passengers (million)	1.4	1.4	1.3	1.3	1.3	1.6	1.3	1.3	1.3	1.3	1.3	1.3
Jeungsan-Baegsan Freight (million tons p.a.)												
Coal domestic	5.6	5.8	6.3	9.4	10.2	6.3	11.4	10.9	11.2	11.7	12.2	12.8
Cement from East Coast	0.9	0.9	1.4	1.9	2.0	1.3	2.1	2.2	2.4	2.5	2.7	2.9
Total	6.5	6.7	7.7	11.3	12.2	7.6	13.5	13.1	13.6	14.2	14.9	15.7
Passengers (million)	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1

SOURCE: KNR Statistics

KOREA

Coal and Cement Distribution Project (Loan 2267-KO)

Jung-Ang Line - Actual Freight and Passenger Traffic

	1981	1982	1983	1984	1985	SAR		1986	1987	1988	Forecast	
						Forecast	1986				1989	1990
Jecheon-Dodam (Dodam-Jecheon direction only) 17.4 km												
Freight (million tons p.a.)												
Coal domestic	2.4	2.9	2.6	0.4	0.4	2.8	0.5	0.7	0.7	0.8	0.9	1.0
Cement	2.0	2.5	3.1	2.7	3.2	5.2	3.5	3.8	4.0	4.4	4.9	5.4
Oil	0.6	0.4	0.3	0.3	0.3	1.1	0.3	0.3	0.4	0.4	0.5	0.5
Others	0.9	1.0	1.2	1.2	1.1	1.5	1.1	1.0	0.9	0.8	0.8	0.7
Total	5.9	6.8	7.2	4.6	5.0	10.6	5.4	5.8	6.0	6.4	7.1	7.6
Passengers (million)	1.8	1.6	1.5	1.5	1.6	3.1	1.6	1.8	1.7	1.8	1.8	1.9
Dodam-Yeongju (Yeongju-Dodam direction only) 46.7 km												
Freight (million tons p.a.)												
Coal domestic	2.6	3.1	3.0	0.7	0.8	3.1	0.9	1.3	1.3	1.5	1.7	2.0
Oil	0.8	0.4	0.3	0.3	0.3	1.3	0.3	0.3	0.4	0.4	0.5	0.5
Others	2.5	1.5	1.7	1.8	1.6	2.0	1.9	2.0	1.9	1.9	2.0	2.0
Total	5.9	5.0	5.0	2.8	2.7	6.4	3.1	3.6	3.6	3.8	4.2	4.5
Passengers (million)	1.9	1.6	1.5	1.6	1.6	3.1	1.6	1.6	1.7	1.7	1.8	1.8
Yeongcheon-Yeongju (Yeongcheon-Yeongju direction only)												
Freight (million tons p.a.)												
Coal domestic	1.9	2.0	2.0	2.2	2.1	2.1	1.9	1.8	1.7	1.6	1.5	1.4
Cement	1.2	1.2	1.3	1.1	0.9	1.7	1.1	1.3	1.7	1.9	2.1	2.4
Ore	2.2	2.3	2.3	2.5	2.7	2.1	2.7	2.4	2.8	2.9	3.0	3.0
Others	0.6	0.5	0.4	0.3	0.3	1.2	0.1	0.8	0.3	0.3	0.3	0.3
Total	5.9	6.0	6.0	6.1	6.0	7.1	5.8	6.3	6.5	6.7	6.9	7.1
Passengers (million)	2.0	1.7	1.6	1.6	1.5	2.9	1.5	1.6	1.7	1.7	1.8	1.8

Note: The 1986 SAR forecast figure of Coal domestic includes 0.3 and 0.6 million tons per annum for Jecheon-Dodam and Dodam-Yeongju, respectively.

SOURCE: KNR Statistics

KOREA
COAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)
FORECAST COAL IMPORTS THROUGH INCHON
([']000 TONS)

YEAR	TOTAL	ANTHRASITE COAL	BITUMINOUS COAL
1986 *	3,108	1,570	1,538
1991 *	4,5484	1,570	3,024
1988	3,178	1,766	1,412
1989	3,471	1,678	1,793
1990	3,484	1,594	1,890
1991	3,510	1,514	1,996
1995	3,931	1,430	2,500
2000	4,311	1,093	3,219

SOURCE: KMPA

* SAR Projections

KOREACOAL AND CEMENT DISTRIBUTION PROJECT (LOAN 2267-KO)STUDIES

STUDY	PURPOSE AT APPRAISAL	STATUS	IMPACT
Seoul Metropolitan Region (Gyeonggi do) Integrated Transport Study	The study is aimed to assess multimodal transport requirements (rail, roads, ports, airports) in the Seoul Region and conduct feasibility studies of selected capacity increase investments. The study estimated to cost US\$1.6 million, was to be funded entirely under the Seventh Railway Project (Loan 183E-KO); but at the request of the government US\$0.6 million of this amount was made available under Loan 2267-KO.	Study began on 12/24/84 and was completed on 12/08/85. The study was conducted by BECOM (France), and KRISHS, KECC, and Yoosim (Korea).	The study recommended the electrification and double tracking of three specific sections: 1) Seoul-Kuro (11.7km.) Construction was begun in 1987 and is expected to be completed in 1992 at a cost of 128.9 B won. 2) Kounchoong-Sadong (55.5km.) Construction is to begin in 1990 with completion in 1998 at an estimated cost of 294.7 B won. 3) Seoul-Pyoong Taek (15.7km.) Construction began in 1978 and is due to be completed in 1992 at a cost of 247.0 B won.

KOREA

Coal and Cement Distribution Project (Loan 2267-KO)

Compliance With Loan Covenants

<u>Section</u>	<u>Activity</u>	<u>Remarks</u>
3.02 (a)	In order to carry out Parts A and B (i) of the Project, the Borrower to relend to KNR, under the KNR Subsidiary Loan Agreement, US\$97,590,761 at conditions identical to the Bank's loan to Government.	Complied with. Onlending agreement was signed August 12, 1983.
3.03 (a)	The Borrower to cause KMPA, in addition to and in parallel with its own administrative procedures, to prepare and submit to MOT and EPB its proposed budgets in commercial form and to maintain its records and accounts in accordance with commercial accounting procedures and practices satisfactory to the Bank.	Complied with.
3.04 (a)	In order to carry out Parts C (iv), D (iv) and F of the Project, the Borrower to relend to KMPA, under an agreement to be entered into between the Borrower and KMPA, US\$23,600,000 at conditions identical to the Bank's loan to the Government.	Complied with. On lending agreement was signed August 13, 1983.
3.04 (d)	By January 1, 1986, the Borrower to cause KMPA to undertake to repay to the Borrower; (i) the proceeds of the Loan made directly to the Borrower under the First Loan Agreement; and (ii) the proceeds of the Loan made available to KMPA under Section 3.04 (a) of the Second Loan Agreement, such repayment to be made pursuant to arrangements satisfactory to the Bank, under	Complied with.

terms and conditions approved by the Bank, including interest at rates identical to those specified in Section 2.06 of the First Loan Agreement, to those specified in Section 2.06 of the Second Loan Agreement, respectively, and payment and grace periods identical to those specified in the Amortization Schedule of the First Loan Agreement and to those specified in the Amortization Schedule of the Second Loan Agreement, respectively.

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| 3.05 | The Borrower to maintain the Project Coordination Committee established within MOT on March 12, 1982 under the Chairmanship of the Director General of the Transport Coordination Bureau of MOT and shall include as members representatives of MOT, MOF, EPB, MCI, MOER, KNR and KMPA. Such committee to meet regularly at least once every three months to advise on the execution of the Project. | Generally complied with. Committee met occasionally to advise on issues which could not be resolved by its Chairman or by the Project Administrator. |
| 3.06 | The Borrower to (a) maintain the position of Project Administrator; (b) in such position hire an officer whose qualification or experience and terms of reference are satisfactory to the Bank; and (c) not later than thirty days after the Effective Date, appoint an officer in service responsible for assisting the Project Administrator in his day-to-day activities under the Project. | Complied with. |
| 3.07 (a),
(b) & (c) | The Borrower to furnish to the Bank, thirty days from the Effective Date, a) a timetable for carrying out Part B (iii) of the Project; b) cause KNR to furnish a timetable for carrying out Parts A (iii), B (i) and (ii) of the Project; and c) cause KMPA to furnish a timetable for carrying out Parts C and D of the Project and then cause to be carried out Parts as approved by the Bank. | Complied with. |

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| 3.08 | The Borrower to cause KMPA to employ, not later than June 30, 1983, consultants to carry out Part F (i) of the Project. | Complied with. |
| 3.09 (d) | The Borrower to prepare Project Completion Report six months after the Closing Date and furnish report to the Bank. | The Bank mission of April/May 1989 discussed the PCR input with the agencies and prepared draft for the Government's review and comments. |
| 3.13 (b) | The Borrower to take or cause to be taken all such action to acquire (i) not later than July 1, 1986, all such land and rights in carrying out Part A (iii) of the Project, and (ii) not later than January 1, 1984, the land and rights in carrying out Part B (ii) of the Project. | Complied with. |
| 4.02 (c)
& (d) | The Borrower to cause KNR to maintain records and accounts and to have its account and financial statements for each year audited and to furnish to the Bank, not later than six months after the end of each such year, certified copies of its financial statement for each year. (Audit covenant covering KNR's project accounts and overall financial statements). | Complied with but frequently several months late. |
| 4.02 (e) | The Borrower to cause KMPA to maintain project accounts and records in accordance with consistently appropriate accounting procedures with respect to Parts C, D and F of the Project. | Complied with but frequently several months late. |
| 4.02 (f) | The Borrower to cause KMPA to have its accounts and financial statements for each year, beginning with fiscal year 1983, audited and furnished to the Bank not later than six months after the end of each such year. | Complied with. |

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| 4.02 (g) | The Borrower to cause KMPA, not later than June 30, 1984 to have its accounts for fiscal years 1979 to 1982 audited and furnish to the Bank by December 31, 1984 the report of such audit. | Complied with. |
| 4.05 (a) | The Borrower to cause KNR to establish, by July 1, 1984, or such date agreed, and thereafter maintain tariffs for the transportation of coal to cover full direct cost. | Not complied with. The Government has not permitted any tariff increases since 1985. Operating ratio has been in excess of 100 in most years. |
| 4.05 (b) | The Borrower to cause KNR to establish, by January 1, 1985, or such other date agreed, and thereafter maintain tariffs for the transportation of cement to fully cover direct costs. | Not complied with. The Government has not permitted any tariff increases since 1985. Operating ratio has been in excess of 100 in most years. |
| 4.06 | The Borrower to cause KNR to establish not later than January 1, 1985 and thereafter maintain differential cost based tariffs for rail transport of bagged and bulk cement cargo. | Not complied with. Government prohibition on tariff increases a major reason. |
| 4.07 | The Borrower to cause KNR to (a) cover its operating costs and finance its capital expenditures commencing fiscal year 1983; and (b) earn an annual rate of return of not less than 2% in 1983, 3.5 % in 1984; 4% in 1985; 5% in 1986, 5.5% in 1987 and 6% in 1988 and thereafter. | Not complied with. 4.2% in FY85; 3.9% in FY86; 3.8% in FY87 and 3.5 % in FY88. |
| 4.08 | The Borrower to cause KNR to attain by December 31, 1988 a ratio of current assets to current liabilities of not less than 1.5 and maintain such ratio thereafter. | Not complied with. 42% in FY85; 42% in FY86; 34% in FY87 and 32% in FY88. |
| 4.09 | KNR to not incur any new long-term debt unless its net revenues for the fiscal year next preceding such incurrence, or for a later 12 month period ended prior to such incurrence, whichever amount is greater, to be not less than 1.1 | Generally not complied with. |

times the maximum debt service requirements for any succeeding fiscal year.

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|------|--|---|
| 4.10 | The Borrower to cause KNR to carry out a revaluation of its fixed assets on an annual basis. | Complied with. |
| 4.11 | The Borrower to cause KNR not to make changes in the investment plan in the aggregate either an increase or a decrease of more than Won 50 billion without concurrence of the Bank. | Complied with. |
| 4.12 | The Borrower to cause KMPA to appoint by January 1, 1986, Terminal Operating Company (TOC) for the operation of Incheon Coal Terminal. The TOC to pay annual fees to KMPA equal to the aggregate amount of: (i) the rates of return to be earned by KMPA; (ii) the rental fees equivalent to the annual provision for depreciation of the terminal's assets; and (iii) the administrative costs incurred by KMPA for supervising the TOC's operations. | The TOC for Incheon Coal Terminal was established in December 1988 and the operation started in January 1989. KMPA imposed outlays of Won 1,829 million and separate charge for the use of coal yard. |
| 4.13 | The Borrower to cause KMPA to earn in fiscal years 1986 and thereafter, an annual rate of return of not less than 5% at Incheon terminal. | The terminal did not start operations until 1989. |

KOREA

Coal and Cement Distribution Project (Loan 2267-KO)

Related Bank Loans and/or Credits

Loan/Credit	Purpose	Year of Approval	Status	Comments
Railroad Project (CR 25-KO)	To assist in financing a significant part of the Korean National Railroad's (KNR) first five year development program (1962-66) through procurement of 115 passenger cars and 800 coal cars and the services of foreign consultants to assist in the establishment of a modern accounting and statistical system for the Railroad.	1962	Completed	PCR was not prepared
Second Railroad Project (CR 110-KO)	To assist in financing the first three years of the Second Five Year Economic Development Plan (1967-71) through construction of new lines, increased station and line capacity, track and structure improvements, and the acquisition of motive power and rolling stock. The credit to finance the import of 600 hopper cars required to meet an unexpected increase in coal traffic by about 25% and 450 tank cars to provide for the expected doubling of the volume of oil traffic over the project period and consulting services.	1967	Completed	PCR was not prepared
Third Railway Project (CR 183/LN 669-KO)	The Project is based on KNR's proposal to expand the 1967-71 investment plan beyond that approved as a basis for Credit 110-KO. To assist in the financing of the last two years of the KNR's Development Plan (1967-71). The Government's Plan was revised in 1968 to meet the needs brought about by the rapid pace of development and KNR also revised its investment in transport capacity to meet the growth in the economy. The project includes motive power and rolling stock, increase in station and line capacity, track renewals and improvement in telecommunications.	1969	Completed	PCR issued; PPAR No. 3034 of June 1980.
Fourth Railway Project (LN 863-KO)	The Project consists of the first three years of KNR's Investment Plan (1972-76). To complete the already started electrification of industrial lines connecting Seoul with the north-eastern part of Korea where coal and cement industries are located; electrification of KNR lines in the Seoul suburban areas as part of the rapid transit project for Seoul Metropolitan area; construction of a new link from the Second Incheon Port to an existing railway line; installation of centralized traffic control in the Seoul area; improvement of	1972	Completed	PCR issued; PPAR No. 3742 of December 1981.

marshalling yards and freight handling facilities; completion of track and rail renewals; bridge strengthening; procurement of track maintenance and renewal equipment; purchase of passenger and freight cars; improvement of facilities for repair of motive power and rolling stock; and installation of some telecommunications facilities.

**First Port Project
(LN 917-KO)**

The project covers the proposals in the 1972-76 Development Program for Pusan and Mukho to meet traffic requirements of these ports up to about 1986 by providing:

In Pusan: (a) a composite pier to handle containers and grain, with storage silos, appropriate equipment and necessary dredging; (b) a dry bulk cargo handling pier with integrated bulk-handling systems, and necessary dredging; (c) international (Korea-Japan) and coastal ferry terminals; (d) rehabilitation of existing general cargo berths; and (e) a new military berth to be financed by the government.

In Mukho: (f) improvements to the coal handling piers and the mechanical loading system; (g) improvements to the existing breakwater ; (h) minor improvements to general cargo and cement berths.

Consulting Services and Technical Assistance: (f) consulting services for the detailed engineering and construction supervision of the above works; the determination of future development requirements. Technical Assistance to assist in establishing KPA and on the job training of personnel.

1972

Completed

PCR issued;
PPAR No. 5756
of June 1985.

**Fifth Railway Project
(LN 1101-KO)**

The project consists of the investments which KNR intends to make during the last two years of the Third Plan (1972-76). It consists of (a) the completion of the electrification of industrial and suburban (Seoul) lines; (b) the completion of centralized traffic control in Seoul area; (c) continuation of double-tracking of the No Nam line and partial doubling of the Tae Baeg line; (d) the acquisition of 50 diesel and 10 electric locomotives; (e) the improvement of marshalling yards and bridge strengthening; (f) way and structure renewal and improvement; (g) the acquisition of spare parts for track maintenance equipment and for the maintenance of the fleet of locomotives and wheel sets for passenger and freight cars; (h) the purchase of 150 passenger and 2,000 freight cars; (i) plant and machinery for workshops and running sheds; and (j) technical assistance to finance the training of KNR staff and the services of an advisor to assist in the execution of a motive power and rolling stock maintenance program.

1974

Completed.

PCR issued;
PPAR No. 3742
of December
1981.

**Second Port Project
(LN 1401-KO)**

To continue development of Pusan Port being financed under the First Port Project (Loan 917-KO). The project consists of 1. Civil Works - (a) 700 m extension of the common user container berths and a 335,000 sq. m. expansion of the stacking area provided under that project;

1976

Completed

PCR issued;
PPAR No. 5756
of June 1985.

(b) dredging to provide an alongside depth of 12.5 m; (c) an access road inside the port limits; a guard house and an 8,000 sq. m. container freight station; (d) ancillary works and utilities; and (e) rehabilitation of piers 3 and 4, the central wharf, and a lighter wharf No. 5. 2. Mechanical Equipment - Procurement of container cranes and mobile container handling equipment. 3. Floating Craft - Procurement of two tug boats. 4. Engineering Consultant Services - to carry out detailed design and supervision of construction and procurement of the above. And 5. Technical Assistance and Training - to assist in cargo handling (including the handling of containers), maintenance, port planning, and accounting.

Sixth Railway Project
(LN 1542-KO)

The Project forms part of KNR's Investment Plan (1977-81), and aims at (a) providing KNR with the capacity required to meet forecast traffic; and (b) reducing operating and maintenance costs. It includes continued double tracking and electrification of lines, extension of yards and terminals, continued installation of centralized traffic control, track and rail renewal, separation of road and rail at crossings, installation of a permanent way workshop, procurement of diesel locomotives, passenger cars and freight cars, provision of a new passenger car workshop, installation of additional telecommunication and power facilities and provision of technical assistance to KNR and conducting transport sector studies. The project will enable the railways to move increasing quantities of bulk commodities and passengers on routes for which the railways remain the most economic mode of transport, thus realizing sizeable savings in transport costs to the entire economy.

1977

Completed

PCR issued;
PCR No. 5090
of May 1984.

Seventh Railway Project
(LN 1836-KO)

To increase the capacity of the transport system in the most economically efficient way and to develop and strengthen the institutions dealing with the transport sector. The main component of the project is the 1980-81 part of KNR's 1977-81 Investment Plan which aims at (a) initiating the institutional changes necessary to gradually transform KNR into a public corporation; (b) providing KNR with the capacity required to meet forecast traffic; and (c) reducing operating and maintenance costs. To finance rails, track maintenance equipment, breakdown cranes, passenger cars, freight cars, workshop equipment, technical assistance and training. The project will enable KNR to move increasing quantities of bulk commodities and passengers on routes for which the railways remain the most economic mode of transport, thus realizing sizeable savings in transport costs to the entire economy.

1979

Completed

PCR issued;
PCR No. 6196
of May 1986.

Seoul -Pusan Corridor
(LN 2600-KO)

The Project forms part of KNR's Management Improvement Program for the development of rail traffic in the Seoul - Pusan Corridor. To reduce losses incurred for ordinary train services as well as to improve other already profitable services offered. The program comprises (a) institutional and policy measures aimed mainly at

1985

On-going

Expected to
close on
12/31/89.

ensuring KNR's long-term viability of the railways by further improving services that are most profitable; (b) measures to improve inter modal complementarity and railway competitiveness and to prepare the ground for a high speed train, a major capacity increase to be introduced in the 90s; and (c) investments in track signalling to increase capacity and in related rolling stock/equipment in line with transport demand. The loan would finance over the 1995-88 period investments under part (c) the resignalling and central traffic control together with the associated technical assistance and training, and KNR and Republic of Korea would fund the other investments.

Pusan Port Project
(LM 2726-KO)

To improve capacity by constructing additional specialized container berths at Pusan Port; to reduce congestion in Pusan City by providing an on-dock storage area to replace storage areas in the city. To meet the Government's objective of increasing the efficiency and reducing the costs of container handling and inland transportation. To improve management and financial control over ports activities and strengthen port planning capabilities.

1985

On-going

Expected to
close on
12/31/92.

Table 12 A

Korea

Coal and Cement Distribution Project (Loan 2267-KO)

Use of Bank Resources

A. Staff Inputs

Stage of Project Cycle	Number of Staff Weeks	Remarks
Through Appraisal	136.0	(1)
Appraisal through Board Approval	29.0	(1)
Board Approval through Effectiveness	9.0	(1)
Supervision	55.0	
Project Completion Report	2.6	
Total	<u>231.6</u>	

Note: (1) Estimates, as the MIS divides the lending operation into different categories.

Korea

Coal and Cement Distribution Project (Loan 2267-KO)

Use of Bank Resources

B. Missions

Stage of Project Cycle	Month/Year	Number of Persons	Days in Field	Special-ization Represented (1)	Performance Rating Status (2)	Types of Problems (3)
1. Through Appraisal						
Preparation						
1	4\77	3	3	FNA\ENG\ECN	----	----
2	4\78	1	4	ECN	----	----
3	5\79	4	7	FNA\ENG\ECN\TSP	----	----
4	9\79	3	3	FNA\ENG\ECN	----	----
5	1\80	3	11	FNA\ENG\ECN	----	----
6	7\80	3	8	FNA\ECN\ENG	----	----
7	9\80	2	3	FNA\ENG	----	----
8	3\81	4	14	FNA\ECN\ENG(2)	----	----
9	6\81	6	14	FNA\ECN\TSP\ENG(3)	----	----
Pre-appraisal						
	9\81	2	20	FNA\ENG	----	----
Appraisal						
1	4\82	4	14	FNA\ENG(2)	----	----
2	9\82	4	14	FNA\ECN\ENG(2)	----	----
2. Appraisal Through Board Approval						
	7\82	2	7	ECN\ENG	----	----
	1\83	1	7	FNA	----	----
3. Supervision						
1	10\83	3	7	FNA\ENG(2)	2	P
Re-appraisal						
	8\84	4	14	FNA\ECN\ENG(2)	----	----
Supervision						
2	8\84	4	7	FNA\ECN\ENG(2)	1	----
3	7\85	3	10	ENG\ECN(2)	S	----
4	11\85	3	1	ECN(3)	S	----
5	5\86	1	2	ECN	----	----
6	11\87	3	4	FNA\ENG(2)	1	----
7	6\88	2	4	FNA\ENG	1	----
8	11\88	2	2	FNA\ENG	1	----

Table 12 B

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- NOTES: (1) FNA = Financial Analyst, ECN = Economist,
ENG = Engineer, TSP = Transport Specialist
(2) 1 = Problem free or Minor Problems, 2 = Moderate
Problems
(3) P = Policy Change on use of coal
(4) S = Mission only reviewed status of study component
of project