China

Qinhuangdao Port E and F Berth Construction Project (1) (2)

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Field Survey: March 2006

1. Project Outline and Japan's ODA Loan

Qinhuangdao Port E and F Berth

1.1 Background

Infrastructure development of coastal regions is said to be one of the pillars of China's Open Door Policy. The outfitting of harbors is considered especially important as they serve as a window to foreign trade and a nexus for the distribution of domestic goods. In light of the rapidly increasing need to handle cargo at ports during China's economic development in the first half of the 1990s, the Chinese government planned in its Eighth Five-Year Plan to build new 180-berths throughout the nation, thereby hoping to increase the cargo handling capacity of coastal harbors from 550 million tons in 1990 to 700 million tons in 1995.

Qinhuangdao port in Hebei Province is one of eight major ports in the nation[1]. In 1991, the harbor was second in the nation in terms of cargo handling capacity, moving approximately 70 million tons of cargo that year. Qinhuangdao port serves a particularly wide region, extending to one direct-controlled city, seven provinces, and three autonomous regions[2]. The economy grew 11.9% in 1990 and 9.2% in 1991, and strong growth was expected to continue because the region was strong in many promising industries. Because regional economic activities exert a strong influence on the volume of cargo handling of Qinhuangdao port, it was expected to diversify the types of cargo

[1] Shanghai, Ningbo, Guangzhou, Tianjin, Qingdao, Qinhuangdao, Dalian, Shenzhen

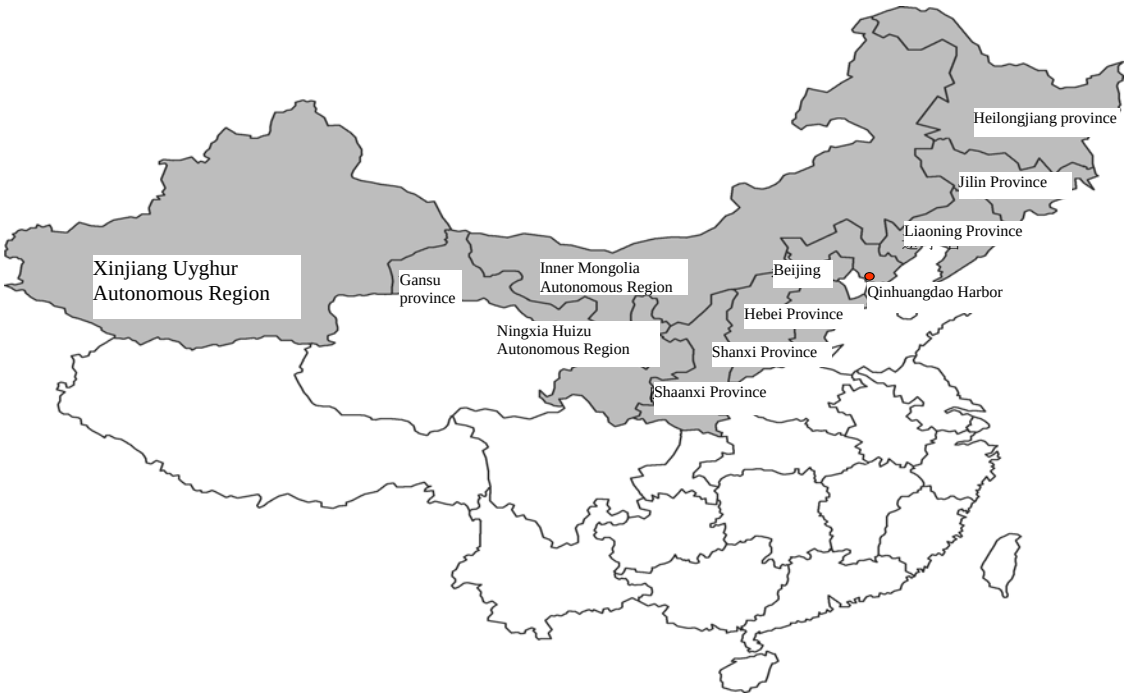
[2] All of the regions of Beijing city, Hebei province, Inner Mongolia autonomous region, Xinjiang Uyghur autonomous region; mainly the western regions of Liaoning province, Jilin province, Heilongjiang province; and mainly the northern regions of Shanxi province, Shaanxi province, Gansu province, Ningxia Hui autonomous region

handled and increase the amount of miscellaneous cargo such as steel, timber, and grain. In the future, it was hoped that Qinhuangdao port could address the shortage of general cargo berths and be outfitted as a comprehensive harbor to promote development in the surrounding region.

1.2 Objective

The project aimed to cope with the rapidly accelerating demand for cargo handling in Qinhuangdao city, Hebei province by constructing seven general cargo berths in Qinhuangdao port. In particular, the project targets the cargo needs of a wide area of economic development that includes one direct-controlled city (Beijing), seven provinces (including Hebei), and three autonomous regions (including Inner Mongolia),

Fig. 1 Greater Sphere Served by Qinhuangdao Port



1.3 Borrower/Executing Agency

Borrower: People's Republic of China's Ministry of Foreign Trade and Economic Cooperation[3] and Ministry of Communications

Executing agency: Qinhuangdao Port Authority (at time of appraisal) Qinhuangdao Port Group Co., Ltd. (at time of evaluation)

Handler for operation, maintenance, and management: Heyi Co., Ltd. (at time of

[3] Since 1999, the recipient of the ODA loan changed to the Ministry of Finance of the People's Republic of China.

appraisal)

Eighth Branch of the Qinhuangdao Port Authority (at time of evaluation)

1.4 Outline of Loan Agreement

	CX IV-P55	CXVI-P55
Loan Amount	3,418 million yen (1)	3,041 million yen (2) Total 6,459 million yen
Disbursed Amount	Total 4,422 million yen	
Exchange of Notes Loan Agreement	October 1992/ November 1992	January 1995/ January 1997
Terms and Conditions - Interest Rate - Repayment Period (Grace Period) - Procurement	2.6% 30 years 10 years General Untied	
Final Disbursement Date	November 1997 (initial schedule) November 2000 (following the delay)	January 2002
Main Agreement	Hyundai Heavy Industries Co. Ltd. (Republic of Korea), Chuwa Bussan Co. Ltd. (Japan), Dalian General Forklift Truck Works P.R., Hubei Machinery & Equipment Import & Export Corporation, China Harbor Engineering Company (China), etc.	
Consulting Services	-	
Feasibility Study (F/S) etc.	1987 F/S (Chinese government) 1990 F/S (JICA) 1992 Basic plan (Chinese government)	

2. Evaluation Result

2.1 Relevance

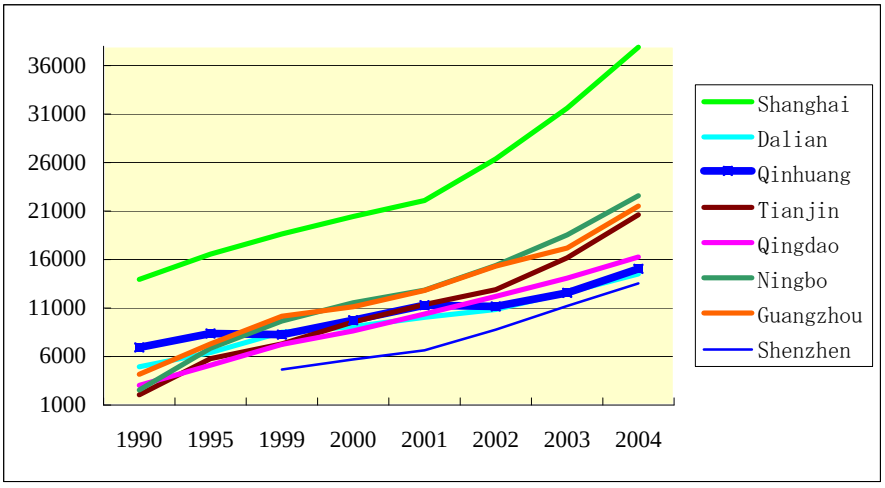
The present project aimed to strengthen the ability of Qinhuangdao port to handle

miscellaneous goods and bulk cargo. As is shown below, the conversion of Qinhuangdao into a comprehensive harbor facility was and still is compatible with government policies dating from both the preliminary appraisal and the present time.

In order to help provide the port cargo handling capabilities needed to match China's rapid economic development, the Chinese government's Eighth Five-Year Plan (1991-1995) sought to increase cargo handling capacities by building new berths in major harbors. China's Ninth Five-Year Plan (1996-2000) placed special emphasis on the provision of transportation systems that could carry coal, oil, iron ore, and freight containers. Qinhuangdao port was close not only to China's capital, Beijing, but also to the chief production region for coal, which centered in Shanxi province. Thus, at the time of the initial appraisal, there already was construction undergoing at Qinhuangdao for a long time to establish its status as China's primary port for shipping coal and was second to Shanghai in cargo handling capacity (see Fig. 2). It was also hoped that Qinhuangdao harbor would serve as a port for shipping and exporting goods produced in the Qinhuangdao Economic and Technological Development Zone, or as a port that could comprehensively handle miscellaneous cargo over the long term. For these reasons, the current project was deemed highly necessary at the time of appraisal.

China's 10th Five-Year Plan (2001-2005) also referred to the provision of a transport system in major harbors and large-volume miscellaneous goods transport systems as its major themes, clearly stating its strategy to construct deep-water berths and form a rational and efficient transportation system. Together with Yantai, Lianyung, and Yingkou, Qinhuangdao is one of several ports that line up to serve the northern region. Deep berths were built to exclusively handle the rising volume of ore imports, and it is hoped that these will handle the need for the iron and steel businesses in Dongbei, Huabei, Huadong, and the lower to middle reaches of the Changjiang river. In addition, in the State Council executive meeting held December 2004, a harbor construction plan for the Changjiang delta, Zhenjiang delta, and Bohai Gulf region was deliberated on and approved. Following that, the plan was to construct three large harbor clusters in three harbor regions achieving rapid economic growth and to build a comprehensive marine transportation network that aims for pier specialization and consolidation of goods handled at the port. For these reasons, the importance of this project continues to be high.

Fig. 2 Changes in the Cargo Handling
Capacity of Eight Major Ports (Unit: 10,000 tons)



Source: China's Public Waterway Transportation Statistics

2.2 Efficiency

2.2.1 Outputs

The present project entailed the construction of two general cargo berths in pier E (cargo handling capacity of 1.2 million tons per year), and five general cargo berths in Qinhuangdao port's pier F (cargo handling capacity of 1.8 million tons per year). At the time of the preliminary appraisal, the ODA loan was to cover all the foreign currency required for the following items.

(1) Berths
Pier E
Two 35,000-ton class berths
Pier F
Two 20,000-ton class berths
Two 15,000-ton class berths
One 10,000-ton class berth

(2) Handling equipment

(3) Harbor railroad

(4) Operating vehicles

(5) Buildings

(6) Various utilities (water supply and drainage, heating, power supply, communications equipment)

(7) Environmental protection equipment and the creation of green tracks of land

(8) Goods inspection equipment

(9) Training

(10) Other (construction of residences for displaced residents)

Among the items described above, (3) harbor railroad, (4) operating vehicles, (5) buildings, and (6) the various utilities were largely conducted as planned. However, the present project in the end did not cover the items (7) environmental protection facilities, (8) goods inspection equipment, (9) training, and (10) other, because they either became unnecessary or had to be conducted through self-financing on account of this project's late start. The major changes in output were as described below.

(1) Pier F berths

As shown in Table 1, the five berths planned at pier F at the time of the preliminary appraisal went through three design changes, and in the end, four berths were constructed. Later on, of the four berths, two were improved by converting them into container berths.

Table 1. Planned and Actual Scale of the Pier F Berths

Targets at Time of Appraisal (December 1994)				Actual Output After Project Completion (December 2001)				Results at Time of Evaluation (March 2006)			
Berths	Depth	Total Extension	Target Ships	Berths	Depth	Total Extension	Target Ships	Berths	Depth	Total Extension	Target Ships
F east side	-11.5m	615.8m	20k DWT 20k DWT	F east side	-14m	601.86m	50k DWT 50k DWT	F east side	-14m	615.7m	50k DWT 50k DWT
			15k DWT	-	-	-	-	-	-	-	-
F west side	-11m	397.8m	15k DWT 10k DWT	F south side	-12.5m	626m	35k DWT 35k DWT	reclamation/improve into container yard reclamation/improve into container yard			

After the start of construction in 1992, through macroeconomic adjustment policies by the Chinese government[4], reevaluation was conducted on all new large-scale projects including this project to decide whether or not to implement them. The first change took place during the June 1996 plan revisions just prior to the restart of the project. During the two years following the preliminary appraisal, ships were being made larger, and to accommodate them, the size of ships targeted by the pier F berths changed from 20,000 ton-class ships to 50,000 ton-class ships, and from 10,000 to 15,000 ton-class ships to 35,000 ton-class ships. At the same time, the design depth of the berths was altered from

[4] To avoid a sudden jump in the prices of construction materials due to the large concentration of new projects, a policy was adopted of not approving the start of new projects until June 1994.

-11.5m to -14m, and from -11m to -12.5m to accommodate the fully loaded draft of the ships using the port.

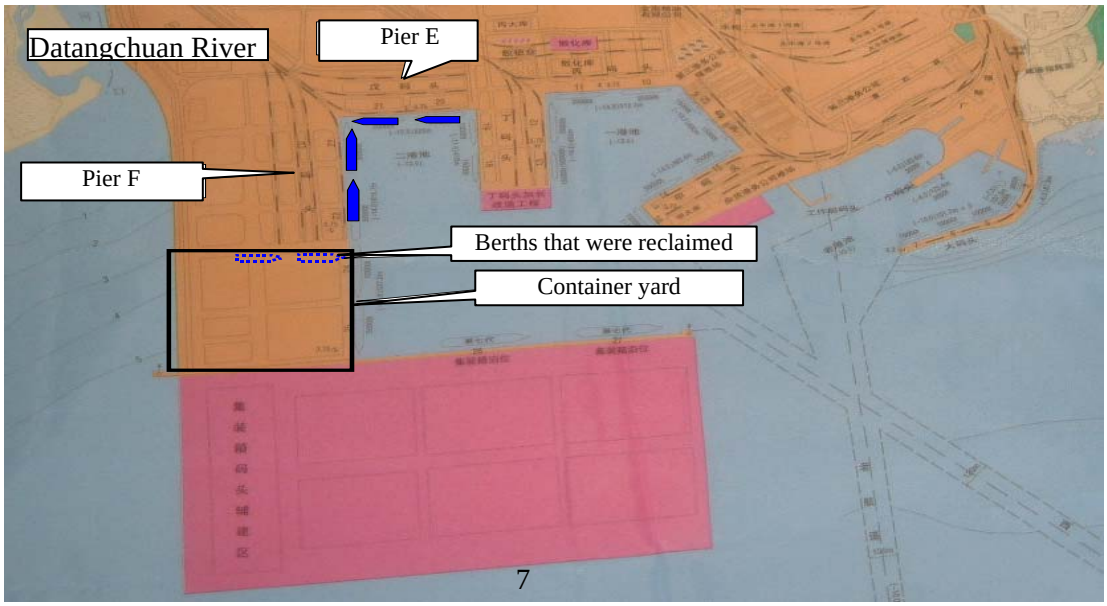
The second change came in June 1999. Two berths that were supposed to be built on the western side of pier F were moved to the southern side. This move was triggered by the floods of 1998, which raised the standard for flood protection; whereas previously a 50-year-flood had been assumed, this was raised to 100-year-flood protection. The western side of pier F is close to the river mouth of Datangchuan river, but in order to observe the provisions for 100-year-flood protection, the width of the river mouth must be maintained , and for that reason the construction site was changed.

The third change came in August 2000. The width of the frontmost river dike for the pier F was expanded. The impact of this change was not substantial.

In addition, by the end of 2002, after the berth construction project was completed, a plan was decided to construct container berths on the south offshore of pier F. It was decided that two berths on the southern side of pier F would be reclaimed as a container yard by October 2004. Because container transport is beneficial for the efficiency and safety when unloading as well as for guaranteeing cargo quality, the employment of containers for general cargo has been progressing rapidly. According to the executing agency, at the stage of 2001, it was assumed that by 2005 40% of general cargo would be housed in containers, and steps have been taken to accommodate that need.

Among the berths that were built through this project, there are four berths that are currently used: the two 35,000 ton-class berths at pier E and the two 50,000 ton-class berths at pier F east. The two southside berths at pier F were reclaimed, and are now being used as a container yard. This was done to cope with the increased demand for cargo handling capacity accompanying the rapid economic growth of recent years, and was accomplished during construction work to expand the harbor.

Ground Layout of Qinhuangdao's Pier E and Pier F



(2) Handling equipment

Between seven and nine years had passed from the plans being made at the time of the preliminary appraisal until the actual purchase. During that time, situation had changed in many ways, including improvements in the technology and changes to the type of cargo handled. Accordingly, advanced and large-scale equipment were purchased. The supply materials and equipment that were purchased for use with the two reclaimed berths were moved to other berths and put to other uses.

Table 2. Planned and Actual Handling Equipment

Planned	Actual
Two 16t-35m portal cranes	Nine 16t-35m portal cranes
Seven 10t-33m portal cranes	Canceled
Three 15t–35m gantry cranes	11 gantry cranes
Four 10t log loaders	Six 10t log loaders
Three 13t log loaders	Six 4t log loaders
11 Q35 tractor trucks	Six Q45 tractor trucks
18 Q20 tractor trucks	Canceled
20 20t trailers	Canceled
34 10t trailers	Canceled
Five 25t mobile cranes	Four mobile cranes
22 16t mobile cranes	Canceled
Eight 5t forklifts	Eight 5t forklifts
23 3t forklifts	Canceled
One 1.5m^3 shovel loader	Canceled
Two 15t-30m movable tower cranes	Canceled
-	Two truck harbor cranes
-	10 25t wheel cranes

2.2.2 Project period

At the time of the preliminary appraisal, the total planned project period was 63 months, from October 1992 to December 1997. In fact the project ran 136 months from October 1992 to January 2004, or 216% of scheduled plan. There were two main reasons the project was prolonged. First, a Chinese government macroeconomic adjustment policy brought about a need to reevaluate and decide whether or not to

execute the project, and so permission by the State Planning Committee to start work was postponed to 1997. Secondly, project cost estimations and planning needed time for revisions, and so the start of real public works was postponed until 1998.

2.2.3 Project cost

In the initial plan devised at the time of the preliminary appraisal, 6,459 million yen, or 63% of the total project cost of 10,210 million yen was to be financed through the ODA loan, with the remaining 37% to be paid for by the Ministry of Communications. In the end, actual total project costs came to 15,764 million yen, of which roughly 28% or 4,422 million yen was covered by the ODA loan (this came to 68% of the planned figure, while the total project cost increased to approximately 154%). Among the reasons for the increase in project costs are an expansion the scale of berths, inflation brought about by correcting dual pricing following 1992, the depreciation in the yen following 1995, and the lengthening of the project period.

Despite attempts to expand the berth scale to accommodate large-scale ships, the design cargo handling capacity of berths continued to be 3 million tons per year on account of changes to the cargo composition. In addition, the work period was extended substantially to 216% of the planned duration, and project costs increased to 154% of target. Taking these facts together, it must be concluded that efficiency for this project is low, though situation surrounding the harbor facilities significantly changed following delays in the project.

2.3 Effectiveness

2.3.1 Cargo handling capacity for general cargo at the Qinhuangdao port

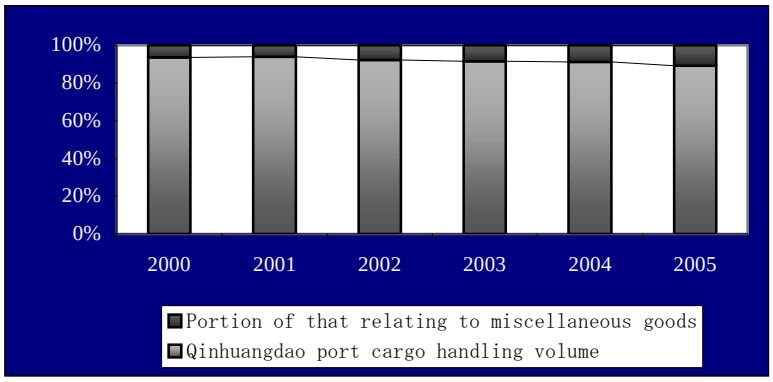
At the time of the preliminary appraisal, Qinhuangdao port’s handling capacity for general cargo other than oil and coal would be 5.20 million tons, but the demand in 1991 was 5.52 million tons, leaving a shortfall of 320,000 tons annually. As the demand was expected to increase to 8.4 million tons in 1995, and 10 million in 2000, eliminating the shortfall became an urgent priority. Outside of the present project, one part of the pier that had been used for coal was converted to handle general goods, and so up to the present time the handling capacity has been increased to approximately 10 million tons. As shown in Table 3, Qinhuangdao port’s general goods cargo handling capacity, while not meeting demand estimates, has nonetheless increased 25% annually. Its total share of the general cargo has risen from 8% in 1991 to 12% in 2005.

Table 3. Qinhuangdao Port Cargo Handling Capacity

Unit: 10,000 tons	2000	2001 (completion)	2002	2003	2004	2005
Qinhuangdao port cargo handling volume	9,743	11,302	11,167	12,562	15,035	16,900
General goods	689	724	936	1,167	1,473	2,046
Percentage of general goods (%)	7%	6%	8%	9%	10%	12%

Source: Qinhuangdao Port Group Co., Ltd.

Fig. 3 General Goods Portion of Qinhuangdao Port Cargo Handled



2.3.2 General cargo handling at pier E and pier F

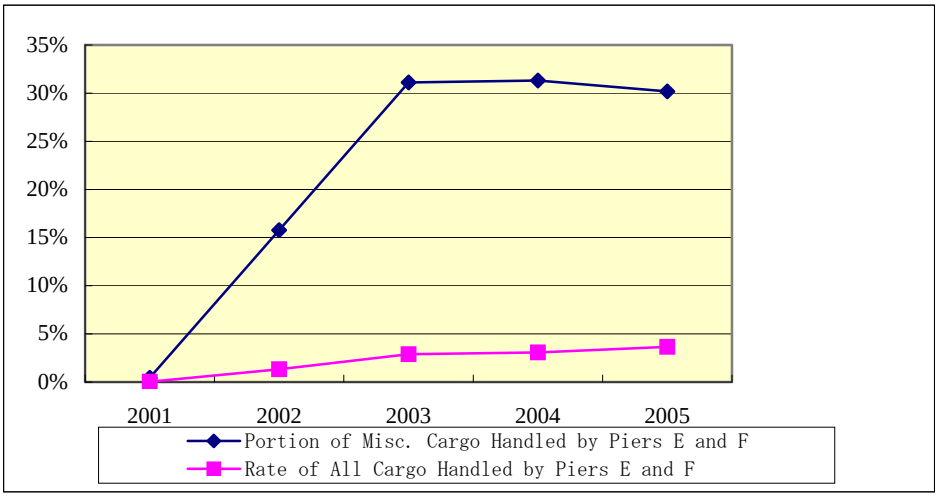
Following completion of project work, the annual miscellaneous cargo handling capacity of pier E and pier F were respectively 1.2 million and 1.8 million, resulting in a total capacity of 3 million tons. In 2003, two years after the piers had begun operation, volume reached 3.63 million tons, exceeding its capacity. By 2005 it had already reached a saturated level of 6.18 million tons, twice the piers' capacity. As shown in Figure 4, the share of cargo handled by piers E and F was 3%-4% of all cargo, or 30% of all general cargoes. Because of the rapid increase in the use of containers for general cargoes, in the future that share is likely to decline. In addition, according to the executing agency, there is some possibility of improvements being made to the container yard for the piers E and F berths.

Table 4. Amount of General Cargo Handled at Piers E and F

(10,000 tons)	2001	2002	2003	2004	2005
Amt. handled	3	148	363	461	618
Rate of increase		4375%	146%	27%	34%

Source: Qinhuangdao Port Group Co., Ltd.

Fig. 4 Share of Cargo Handled at Piers E and F



Source: Qinhuangdao Port Administrative Affairs Group

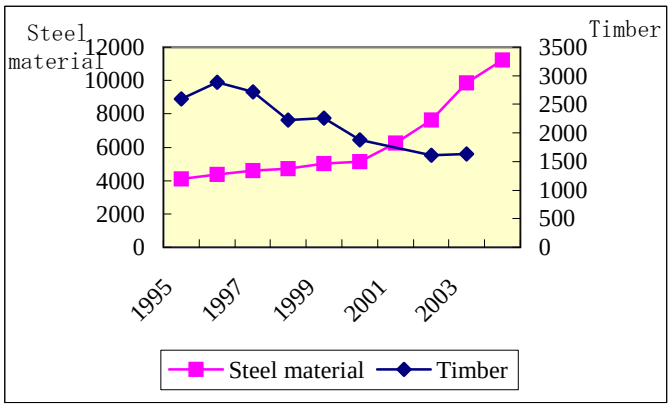
At the time of the preliminary appraisal, estimates of the cargo handled at piers E and F broke down to 15% for steel material, 20% for timber, and 65% for other items. At the present time, steel accounts for roughly 79% of cargo. As shown in Fig 5, whereas for the past 10 years there has been a reduction in the production of timber in its hinterland, the increase in steel materials following expanded production of steel has had a big impact. In addition, at Qinhuangdao port, each pier has specialized in specific type of cargo, and general cargo increasingly introduced containerization as a measure for its low transportation cost. Against this backdrop, the handling share of steel materials, for which container transport is not possible, increased.

Table 5 Breakdown by Article Type of General Cargo at piers E and F

List of articles	Cargo handled (10,000 tons)	Percentage
Steel materials	487	78.8%
Steel	53	8.5%
Other (sand, chemical fertilizers, school supplies, electronic goods, etc.)	78	12.7%
Total	618	100%

Source: Qinhuangdao Port Group Co., Ltd.

Fig. 5 Changes in Production of Steel Material and Timber in its Hinterland



(Unit: steel material 10,000 tons/timber 10,000m)

Source: Qinhuangdao Port Group Co., Ltd.

Table 6 provides a breakdown of internal and external trade as well as incoming and outgoing transport at piers E and F in 2005. At the time of the preliminary appraisal, the ratio of internal to external trade for general cargo was 1:4, whereas in 2005 the ratio was 1:1. Qinhuangdao port had few foreign routes, and following competition arising from the liberalization of port functions in 2001, the external trade share decreased due to its lack of competitive edge. On the other hand, the breakdown for incoming and outgoing cargo was as predicted at the time of the preliminary appraisal. With incoming cargo accounting for roughly 20%, and outgoing at 80%, outgoing cargo was by far the greater. Most of cargo handled was transported by rail, but there are national regulations on the Daqin railway, which handles most of the rail transport routes, limiting one-direction loading from the hinterland to Qinhuangdao port. For that reason, the

transport of freight from Qinhuangdao port to its hinterland cannot use the Daqin railway. This restriction on the transport capability from Qinhuangdao port out to the hinterland is the reason why incoming transport is so low.

Table 6. Breakdown for Piers E and F in 2005

	Cargo Volume (10,000 tons)	Percentage (%)		Cargo Volume (10,000 tons)	Percentage (%)
External trade	290	47%	Outgoing	521	84%
Internal trade	328	53%	Incoming	96	16%
Total	618	100%	Total	618	100%

Source: Qinhuangdao Port Group Co., Ltd.

2.3.3 Recalculation of the Financial Internal Rate of Return (FIRR)

Taking 1998 as the base year and the project life as 30 years, the Financial Internal Rate of Return (FIRR) was recalculated to be negative, and thus below the 3.3% figure calculated at the time of the initial appraisal. Costs included project costs, operation and maintenance costs, and taxes. Benefits included revenue from loading and unloading cargo, warehouse revenue, port management revenue, and other related business revenue. A distinction was made between business and non-business figures. There were two main reasons for the negative FIRR. First, project costs increased. Secondly, a change in social policy caused personnel costs to rise, which in turn led annual operation and management costs to balloon from 19.22 million yuan to 117.11 million yuan.

As described above, the internal rate of return was negative. However, because one of the reasons for this was that personnel expenses increased in response to a policy change, and because the expected targets for general cargo handling were met, the effectiveness of this project is not a problem.

2.4 Impact

2.4.1 Regional economic development

The Chinese government built transportation infrastructure that connects the harbor with coal production areas in Shanxi province and Shaanxi province. By bolstering the coal transport capabilities, the government has assisted with development in the production regions. Qinhuangdao port has achieved the important role as a major coal exporting port where coal transported from the above regions is shipped abroad or to coastal regions in the Dongbei, Huabei, or Huadong regions. That alone, however, would not be enough to effect large-scale development in the hinterland or local regional economies. The present project outfitted the harbor as a comprehensive port

including one for general cargo, and aimed to stimulate the economy of the hinterland and Qinhuangdao city.

2.4.1.1 Economic development in the hinterland

Formerly, the transportation infrastructure was a major constraint to economic development in the hinterland, but recently the transportation capability of the Daqin railway, which runs from Datong to Qinhuangdao, and the Jingqin railway, which runs from Beijing to Qinhuangdao, has expanded. The road condition from Chengde to Qinhuangdao, Tianjin to Qinhuangdao, Beijing to Qinhuangdao to Shenyang has improved. Little by little a transportation network has been established. Plans are in place for the construction of the Bohai Sea Coastal Expressway or the Tianjin-Qinhuangdao railway, or the Sanshenmiao-Daoerdeng Railway by 2010, and these will hopefully improve the cargo transport capability in the hinterland.

Fig. 6 Qinhuangdao Transportation Access

Regarding the production levels of key industries and agriculture in the hinterland, comparing 1995 with 2004, coal increased 1.21 times, oil 1.11 times, steel materials 2.74 times, cement 2.08 times, timber 0.63 times[5], chemical fertilizers 1.65 times, rice 1.68 times, wheat 0.83 times, corn 1.2 times, soy 1.48 times. Thus, except for timber and wheat, all items showed increases. In particular the growth of steel materials, cement, and chemical fertilizers, which are treated as general items, is high. And the

[5] Change between 1995 and 2003.

average nominal growth rate of Gross Regional Domestic Product (GRDP) for the hinterland was 13%, relative to 11% nationwide.

Table 7. GRDP of the greater surrounding area

Region	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Beijing city	1,084	1,395	1,616	1,810	2,011	2,174	2,479	2,846	3,213	3,663	4,283
Hebei province	2,187	2,850	3,453	3,954	4,256	4,569	5,089	5,578	6,123	7,099	8,769
Shanxi province	854	1,092	1,308	1,480	1,486	1,507	1,644	1,780	2,018	2,457	3,042
Inner Mongolia autonomous region	682	833	985	1,100	1,192	1,268	1,401	1,546	1,734	2,150	2,712
Liaoning province	2,462	2,793	3,158	3,582	3,882	4,172	4,669	5,033	5,458	6,003	6,873
Jilin province	937	1,129	1,337	1,447	1,558	1,661	1,821	2,032	2,246	2,523	2,958
Heilongjiang province	1,619	2,015	2,403	2,708	2,833	2,897	3,253	3,561	3,882	4,430	5,303
Shaanxi province	817	1,000	1,175	1,300	1,382	1,488	1,661	1,750	2,036	2,399	2,884
Gansu province	452	553	714	781	870	932	983	1,073	1,161	1,304	1,559
Ningxia Hui autonomous region	134	170	194	211	227	241	266	298	329	385	461
Xinjiang Uyghur autonomous region	674	825	912	1,050	1,117	1,169	1,364	1,485	1,598	1,878	2,200
Total for the hinterland	11,900	14,655	17,254	19,424	20,813	22,078	24,630	26,982	29,799	34,290	41,044
Nominal growth rate		23%	18%	13%	7%	6%	12%	10%	10%	15%	16%
Nationwide	46,759	58,478	68,594	74,463	78,345	82,068	89,468	97,315	105,172	117,390	136,876
Nominal growth rate		25%	17%	9%	5%	5%	9%	9%	8%	12%	14%

(Unit: 100 million yuan)

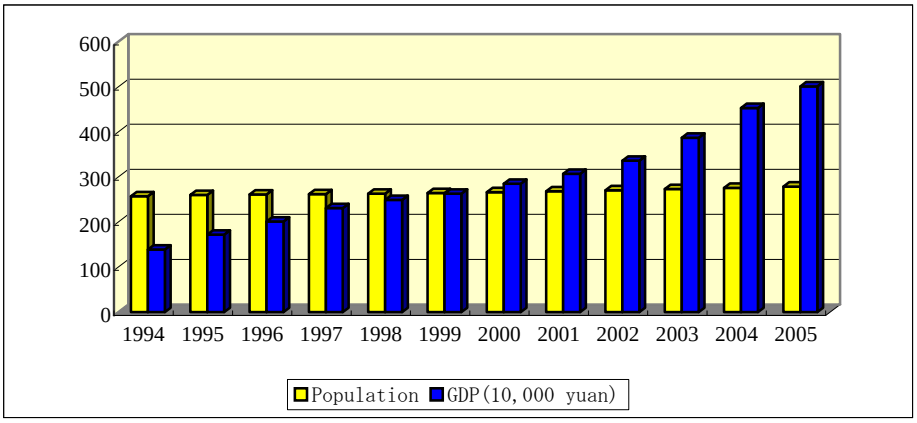
2.4.1.2 Economic development of Qinhuangdao city

The GDP for Qinhuangdao city in 1994 was 1.39 million yuan. At the time, the population was 2.57 million people, and the GDP per capita was 5,410 yuan. By contrast, GDP in 2005 was 5.01 million yuan, and given a population of 2.79 million, GDP per capita was 17,960 yuan. That is, whereas GDP increased 3.6 times over the past 12 years, population increased only 1.08 times, and GDP per capita was thus 3.3 times higher. Thus, the increase in GDP is thought to stem from forces other than an increase in population. In particular, a mere 1.5km west of Qinhuangdao port, development of the Qinhuangdao Economic and Technological Development Zone is

remarkable[6]. From 2001 to 2005, the number of companies rose from 52 to 105, and the investment amount rose from 45.88 million dollars to 166.66 million dollars. Growth was high during the same period, with economic growth rate at 36% export growth rate at 38%, and import growth rate at 75%. In this same development zone, the facilities at Qinhuangdao port are a major selling point for attracting businesses to the area. In the 11th Five-Year Plan, GDP growth rate is forecast to be 30%, centering on the development of the import-export industry. The increase in Qinhuangdao port's general cargo handling volume generated increases in import of raw materials, their processing, manufacturing, and product export, which contributed to the manufacturing and processing industries of Qinhuangdao city.

In this way, the present project has made a certain contribution to the economic development of Qinhuangdao city and its hinterland.

Fig. 7 Population and GDP of Qinhuangdao City



Source: Qinhuangdao City Bureau of Statistics

Table 8. Outline of Qinhuangdao Economic and Technological Development Zone

		2001	2002	2003	2004	2005
No. of companies	companies	52	58	77	84	105
Growth rate	%		12%	33%	9%	25%
Amt.	$10,000	4,588	8,118	10,678	13,347	16,666

[6] In October 1984, after receiving approval of the State Council, the development zone was established to foster key industries like metallurgy, machinery, electronics, spinning, fine chemicals, building materials and food processing. Major foreign companies involved included the Itochu Corporation of Japan, the LG Group of Republic of Korea, Chia Tai Group of Thailand, the TI Group of the United Kingdom, the Reynolds Group of the United States, and ADM Co., Ltd. of Singapore.

invested						
Growth rate	%		77%	32%	25%	25%

		2001	2002	2003	2004	2005
GDP	10,000 yuan	268,000	350,335	520,043	732,138	920,491
Growth rate	%		31%	48%	41%	26%
Amt. exports	$10,000	16,545	20,421	26,043	44,379	58,298
Growth rate	%		23%	28%	70%	31%
Amt. imports	$10,000	9,951	19,542	35,060	50,391	91,310
Growth rate	%		96%	79%	44%	81%

Source: Qinhuangdao City Economic and Technology Development District

2.4.2 Impact on the environment

2.4.2.1 Displacement of residents

At the time of the preliminary appraisal, though on a small scale, it was decided that the present project should provide new homes for displaced residents. The actual building site was land for temporary warehouse use belonging to the Hebei Foreign Trade Co., and no residents were actually displaced. After the start of construction, the Qinhuangdao Port Authority Construction Oversight Department expropriated the warehouse and provided compensation to the company.

2.4.2.2 Other areas of environmental impact

There are five observation points inside of Qinhuangdao port, and the Environmental Protection Bereau of Qinhuangdao Government is periodically monitoring the following items. The Qinhuangdao Port Group Co. Ltd.'s Environmental Hygiene Department is monitoring levels of ocean pollution twice a year and reporting the results to the city government. According to the results, the present project has not had a major adverse impact on the environment.

(1) Atmosphere

Most of the atmospheric pollution is in the form of smoke, soot, sulfur dioxide, nitrogen oxide and other particulates emitted by four 4-ton coal boilers for use in providing heating. Dust removal and desulfurization devices were installed on the boilers, and metal dust is handled by periodic watering of the equipment and cleaning. The atmospheric pollution quality in the vicinity of pier E and F from 2001 to 2005 was as shown in Table 10. Air quality more or less satisfied National Ambient Air Quality Standard GB3095-1996.

Table 9. Air Pollutant Concentration Levels

Item Observed	Max. Level Allowed Under National Standard GB3095-1996	2001	2002	2003	2004	2005
SO_2	0.06	0.046	0.053	0.050	0.081	0.075
NO_X	0.05	0.032	0.031	0.030	0.026	0.032
PM_{10}*	0.10	0.082	0.114	0.091	0.111	0.104

*Particulate matter smaller than 10 microns.

Source: Qinhuangdao Port Group Co., Ltd.

(2) Water quality

Most of the water pollution derives from domestic wastewater, waste oil, and ship sewage. After being treated in a bio-oxidation tank, the domestic wastewater is sent to the municipal sewage treatment plant. As for oil waste and ship sewage, they are processed in a prescribed location and then discharged. Table 10 shows the ocean water quality in observation areas for the years 1994 and 1997 to 2005. As can be seen, the measurements conform to Ocean Water Quality Standard GB3096-1997.

Table 10. Water Pollutant Concentration Levels

Item Observed	Max. Level Allowed Under National Standard GB3096-1997	1994	1997	1998	1999	2000	2001	2002	2003	2004	2005
COD	5	1.73	0.94	1.11	1.00	0.96	0.84	0.99	0.60	1.43	0.39
NH_3-N	0.5	0.07	0.06	0.07	0.09	0.05	0.11	0.08	0.09	0.10	0.11
Petroleum products	0.5	0.016	0.105	0.173	0.148	0.090	0.079	0.100	0.090	0.062	0.059

Source: Qinhuangdao Port Group Co., Ltd.

(3) Noise

Through the installation of noise abatement devices and employment of low-noise machinery and motors, together with the sensible guiding of vehicles, noise has been kept down to a minimum. Noise levels are within both the Standard of Environmental Noise of Urban Area GB3096-93 and Standard of Noise at Boundary of Industrial Enterprises GB12348-90.

(4) Solid waste

Trash from ships is gathered together by a specialized team and buried in a designated location. Domestic trash is disposed of in a designated location. Coal ash is recycled as a building material.

2.5 Sustainability

2.5.1 Executing agencies

2.5.2.1 Technical capacity

The Eighth Branch of the Qinhuangdao Port Group Co.,Ltd, a lower branch of the Qinhuangdao Port Group Co., Ltd., has 579 employees. Of these, 13 are engaged in operation, maintenance, and management as part of the Administration Department Technology Provision Section. Another 415 employees work in the four-section Operations Department. These break down into 88 people in the Operation and Maintenance section, 117 in the Portal Crane section, 192 in the Yard Section, and 18 in the Security Guard section. Thus the employees in these two major departments comes to 428. These employees are all successful applicants who have passed a company general written examination and national special written and operation examinations. In addition, most of these employees are transfers from Heyi Co., Ltd, and thus have a wealth of experience. Thus, no issues are seen in the area of technical capabilities.

All engineers receive training on cargo handling and equipment renovation through the education center under the Qinhuangdao Port Group Co., Ltd. and the employee education committee. The total number of trainees receiving training between 2002 and 2005 was 2,235[7]. Besides that, technical managers or engineers every year have a chance to receive education lasting from half a year to two years.

Judging from the state of technical levels, employee histories, and technical training, there are no problems on the technical front.

2.5.2.2 Structure

At the time of the preliminary appraisal, the executing agency was the Ministry of Communications. The de facto executing agency was the Qinhuangdao Port Authority. Loading and unloading work at piers E and F and operation and maintenance of facilities was to be performed by the newly established Heyi Co., Ltd. Thanks to administrative reforms implemented up until September 2002, cruise control, foreign trade cargo export management, permission to conduct business, promotion of fair competition and other administrative functions were handled by the Hebei Province

[7] In 2002 there were 220 trainees over 13 sessions; in 2003, 470 trainees over eight sessions; in 2004, 677 trainees over 12 sessions; and in 2005, 868 trainees over 14 sessions.

Transportation Agency's Port Management Bureau and the Qinhuangdao City Transportation Agency's Port Management Bureau. Port construction and management was entrusted to the Qinhuangdao Port Group Co., Ltd. At present, the de facto executing agency is the Qinhuangdao Port Group Co., Ltd., and management and operation and maintenance is being handled by the Eighth Branch of the Qinhuangdao Port Group Co.,Ltd which was established in July 2001.

The Qinhuangdao Port Group Co., Ltd. has eight administrative divisions and one office, including the production division, engineering and design division, safety and quality control division, and so forth. The company has approximately 18,000 employees in total including branch companies Nos. 1-8 that undertake loading/unloading and maintenance of the pier under direct supervision, technical centers, or other subsidiary companies.

The Eighth Branch of the Port Authority has 164 employees in nine sections and one office that manage pier E and F, as well as four operations divisions with 415 employees that handle cargo handling. In all, the organization has 579 employees.

Fig. 8 Organization Chart of Qinhuangdao Port Group Co., Ltd.

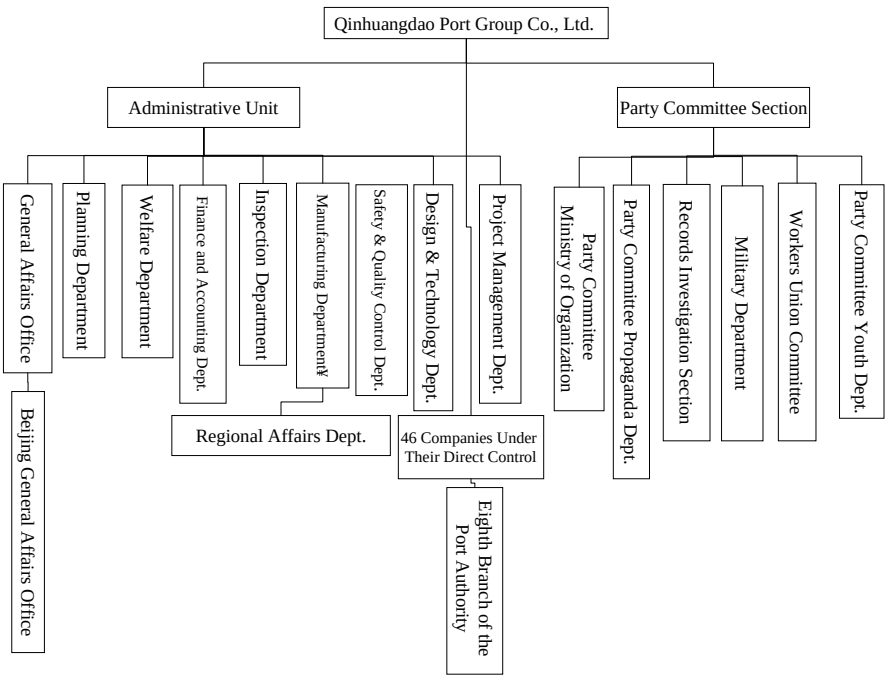
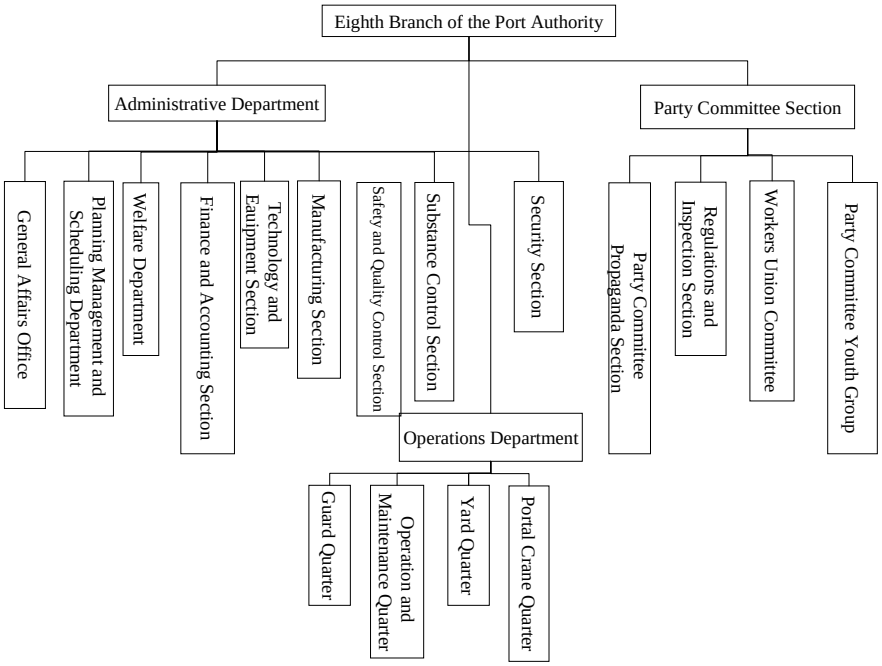


Fig. 9 Eighth Branch of the Qinhuangdao Port Authority



2.5.2.3 Financial status

Annual operating revenue for the Eighth Branch of the Qinhuangdao Port Authority has grown from 53.86 million yuan in 2003 and 72.15 million yuan in 2004 to96.58 million yuan in 2005. However, operating costs have exceeded revenue, recording 82.33 million yuan, 94.33 million yuan, and 117.71 million in those years, respectively. Net losses came to 50.61, 51.07, and 55.97 million yuan annually, thus recording deficits in each year. Among the reasons for bloated outlay are vast depreciation expenses and bloated personnel expenses stemming from excess redundancy in employee hiring.

Meanwhile, annual operating revenue for the Qinhuangdao Port Group Co., Ltd. was 2.17798 billion yuan in 2003, 2.60717 billion yuan in 2004, and 2.88012 billion yuan in 2005. Net profit for those years was, respectively, 87.18, 300.85, and 377.23 million yuan, thus exhibiting favorable growth. Capital was 7.59119 billion yuan in 2003, 7.95121 billion yuan in 2004, and 8.72094 billion yuan in 2005. The company's capital ratio was favorable, recording 74%, 67%, and 57% for those years, respectively. Among port companies, it was the third best nationwide. Eighth Branch of the Qinhuangdao Port Authority is subordinate on the Qinhuangdao Port Group Co. Ltd. in its business functions. Although it is kept separate in the accounts, the Branch is not financially

self-sustainable. While its financial state is rather harsh, in the mid- to long-term, because it can expect to receive financial support from the Qinhuangdao Port Group Co., Ltd., sustainability is not considered to be a problem.

Table 11. Financial Indicators for the Qinhuangdao Port Group Co., Ltd.

	2003	2004	2005
Return on assets (%)	1%	2%	3%
Gross profit margin (%)	50%	53%	51%
Net profit margin (%)	5%	10%	16%
Turnover of total capital (times)	21	22	19
Current ratio (%)	141%	82%	55%
Capital ratio (%)	74%	67%	57%

2.5.2 Operation and maintenance

The present investigation confirmed that operation and maintenance for cargo handling equipment, railways, and other equipment and machinery were largely adequate. No less than 33 regulations and procedural documents have been established for the operation and maintenance of equipment, including “Regulations for the Annual Operation and Maintenance of Equipment,” “Method on the Monthly Operation and Maintenance of Equipment,” and “Periodic Inspections and Management of the Eighth Branch Cranes.” Work tasks are being executed in conformance with these regulations. On the safety front, too, 11 regulations and procedural documents have been established. These include the “By-laws on the Enforcement of Cargo Quality,” “Standardization of Safety Management for Work Parties,” “By-laws on the Enforcement of Fire-Fighting Safety Management,” “Environmental Conservation Management,” “Emergency Manual in the Event of Environmental Pollution Accidents,” and “Rescue Manual in the Event of On-the-Job Accidents.” Based on an oral survey conducted with the executing agency, since the start of operation in 2001, they claim that there have been no major accidents, that the operation has been safely carried out and that organizationally there is no problem with operation and maintenance, and so this project is likely to have a lasting effect.

3. Feedback

3.1 Lessons Learned

Japan Bank for International Cooperation

Repeated design changes and design revisions to the overall harbor following the preliminary appraisal significantly lowered the project's efficiency. Detailed design decisions and approaches should have been based on long-term supply and demand estimations as well as clarification of the role of Qinhuangdao port. Chinese government policies resulted in major delays in the present project. Project plans had to be revised in response to the rapid economic growth of recent years, but during the decision-making process, the JBIC should actively participate by providing advice during the decision-making process. It is not enough to strengthen midway reviews or to confirm the state of progress and the necessity of design changes; in cases where modifications are highly necessary, both countries should carefully negotiate with each other, basing their negotiations on plenty of evidence, before making a final decision on the relevance of modifications.

3.2 Recommendations

None.

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Project Scope		
(1) Berths 1) pier E	Two 35k-ton class berths with depth of -12.5m (Handling capacity 1.2 million tons/yr)	As planned.
2) pier F	Two 20k-ton class berths with depth of -11.5m Two 15k-ton class berths with depth of -11.5m -11m One 10k-ton class berth with depth of -11m (Handling capacity 1.8 million tons/yr)	Two 50k-ton class berths with depth of -14m (Handling capacity 1.8 million tons/yr)
(2) Handling equipment	Portal cranes, yard gantry cranes, log loaders, tractor trucks, mobile cranes, forklifts, shovel loaders, moveable tower cranes	Portal cranes, log loaders, moveable cranes, forklifts, track barbor cranes, wheel cranes, tractors
(3) Harbor railroad	12.08 km	13.81km
(4) Operation vehicles	Two diesel locomotives	As planned
(5) Buildings	Maintenance shops, dining halls, rest areas, etc.	As planned
(6) Various utilities	Water supply and drainage, heating supply, power supply, communications	As planned
(7) Environmental protection equipment	One atomic absorption photoscope one thermal testing device	Handled through self-funding
Creation of green tracks of lands	51,200m^2	As planned
(8) Goods inspection equipment		Canceled
(9) Training	Foreign training on provision of large-sized cargo handling equipment and efficient operation and management pertaining to docks handling general cargo	Canceled
(10) Other	Construction of buildings following the relocation of residents	Canceled
(2) Project Period	October 1992-December 1997 (67 months)	October 1992-January 2004 (136 months)

・ Public works	June 1992-December 1997	June 1992-December 2001
・ Handling equipment	June 1994-December 1997	January 1999-December 2001
・ Railroads	June 1995-December 1997	January 2001-December 2001
・ Vehicles etc.	June 1995-June 1997	January 2001-December 2001
・ Buildings	January 1995-December 1997	January 1999-December 2001
・ Utilities	April 1995-September 1997	April 1995-September 1997
・ Environmental protection equipment	June 1996-June 1997	-
・ Goods inspection equipment	June 1994-December 1995	-
・ Training	June 1992-June 1997	-
(3) Project cost Foreign currency Local currency Total ODA Loan Portion Exchange rate	 6,459 million yen 3,751 million yen 315.25 million yuan) 10,210 million yen 6,459 million yen 1 yuan = 12 yen	 4,422 million yen 11,342 million yen 782.75 million yuan) 15,764 million yen 4,422 million yen 1 yuan = 14.49 yen