

ASIAN DEVELOPMENT BANK

PCR: PRC 27110

PROJECT COMPLETION REPORT

ON THE

SECOND YANTAI PORT PROJECT
(Loan 1411-PRC)

IN THE

PEOPLE'S REPUBLIC OF CHINA

December 2003

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

| | At Appraisal (31 August 1995) | At Project Completion (10 October 2003) |
|-----------|---|---|
| CNY1.00 = | \$0.12 | \$0.12 |
| \$1.00 = | CNY8.35 | CNY8.276 |

ABBREVIATIONS

| | | |
|------|---|------------------------------------|
| ADB | – | Asian Development Bank |
| CTOP | – | Container Terminal Operations Plan |
| EIRR | – | economic internal rate of return |
| EPZ | – | Export Processing Zone |
| FIRR | – | financial internal rate of return |
| PMO | – | project management office |
| PRC | – | People's Republic of China |
| WACC | – | weighted average cost of capital |
| YTPA | – | Yantai Port Authority |

WEIGHTS AND MEASURES

| | | |
|---|---|--|
| dwt (deadweight ton) | – | total carrying capacity of a ship, including cargo, fuel, water, and stores |
| teu (twenty- foot equivalent unit) | – | standard unit of measurement for container traffic |

NOTES

In this report, "\$" refers to US dollars.

CONTENTS

| | Page |
|---|------|
| BASIC DATA | i |
| MAPS | v |
| I. PROJECT DESCRIPTION | 1 |
| II. EVALUATION OF DESIGN AND IMPLEMENTATION | 1 |
| A. Relevance of Design and Formulation | 1 |
| B. Project Outputs | 2 |
| C. Project Costs | 3 |
| D. Disbursements | 3 |
| E. Project Schedule | 3 |
| F. Implementation Arrangements | 4 |
| G. Conditions and Covenants | 4 |
| H. Related Technical Assistance | 5 |
| I. Consultant Recruitment and Procurement | 5 |
| J. Performance of Consultants, Contractors, and Suppliers | 6 |
| K. Performance of the Borrower and the Executing Agency | 6 |
| L. Performance of the Asian Development Bank | 6 |
| III. Evaluation of Performance | 7 |
| A. Relevance | 7 |
| B. Efficacy in Achievement of Purpose | 7 |
| C. Efficiency in Achievement of Outputs and Purpose | 8 |
| D. Preliminary Assessment of Sustainability | 10 |
| E. Environmental, Sociocultural, and Other Impacts | 11 |
| F. Project Operations | 13 |
| IV. OVERALL ASSESSMENT AND RECOMMENDATIONS | 14 |
| A. Overall Assessment | 14 |
| B. Lessons Learned | 14 |
| C. Recommendations | 15 |
| APPENDIXES | |
| 1. Chronology of Major Events | 17 |
| 2. Completion of Works Planned | 19 |
| 3. Financing Plan | 20 |
| 4. Procurement Details | 21 |
| 5. Implementation Schedule | 22 |
| 6. Compliance with Loan Covenants | 23 |
| 7. Technical Assistance Completion Report | 26 |
| 8. Socioeconomic Development | 28 |
| 9. Port Sector Development | 30 |
| 10. Yantai Port Development | 32 |
| 11. Financial Performance | 36 |
| 12. Financial Reevaluation | 44 |
| 13. Economic Internal Rate of Return | 46 |

BASIC DATA

A. Loan Identification

| | | |
|----|------------------|--------------------------------|
| 1. | Country | The People's Republic of China |
| 2. | Loan Number | 1411-PRC |
| 3. | Project Title | Second Yantai Port |
| 4. | Borrower | The People's Republic of China |
| 5. | Executing Agency | Yantai Port Authority |
| 6. | Amount of Loan | \$53.0 million |
| 7. | PCR Number | PCR: PRC 784 |

B. Loan Data

| | | |
|----|----------------------------------|--|
| 1. | Appraisal | |
| | - Date Started | 3 May 1995 |
| | - Date Completed | 24 May 1995 |
| 2. | Loan Negotiations | |
| | - Date Started | 25 October 1995 |
| | - Date Completed | 27 October 1995 |
| 3. | Date of Board Approval | 12 December 1995 |
| 4. | Date of Loan Agreement | 11 December 1996 |
| 5. | Date of Loan Effectiveness | |
| | - In Loan Agreement | April 1997 |
| | - Actual | 11 March 1997 |
| 6. | Closing Date | |
| | - In Loan Agreement | 30 June 2000 |
| | - Actual | 10 March 2003 |
| | - Number of Extensions | 1 |
| 7. | Terms of Loan | |
| | - Interest Rate | Pool-based variable lending for US Dollars |
| | - Maturity (number of years) | 24 |
| | - Grace Period (number of years) | 4 |
| 8. | Terms of Relending | |
| | - Interest Rate | Pool-based variable lending for US Dollars |
| | - Maturity (number of years) | 24 |
| | - Grace Period (number of years) | 4 |

9. Disbursements

a. Dates

Initial Disbursement
22 January 1998

Final Disbursement
10 March 2003

Time Interval
61.5 months

Effective Date
11 March 1997

Original Closing Date
30 June 2000

Time Interval
39.5 months

b. Amount (\$)

| Category No. | Description | Original Allocation | Last Revised Allocation | Amount Canceled ^a | Net Amount Available | Amount Disbursed | Undisbursed Balance |
|--------------|---------------------------|---------------------|-------------------------|------------------------------|----------------------|-------------------|---------------------|
| I | Dredging and Marine Works | 20,900,000 | 19,000,000 | 501,417 | 18,498,583 | 18,498,583 | 0 |
| II | Cargo Handling Equipment | 24,100,000 | 21,050,000 | 6,044 | 21,043,956 | 21,043,956 | 0 |
| III | Other Equipment | 5,100,000 | 5,800,000 | 12,480 | 5,787,521 | 5,787,521 | 0 |
| IV | Training | 500,000 | 500,000 | 132,656 | 367,344 | 367,344 | 0 |
| V | IDC | 2,800,000 | 3,800,000 | 0 | 3,800,000 | 3,800,000 | 0 |
| VI | Unallocated | 9,600,000 | 2,850,000 | 2,850,000 | 0 | 0 | 0 |
| Total | | 63,000,000 | 53,000,000 | 3,502,597 | 49,497,403 | 49,497,403 | |

\$ = US dollars, IDC = interest during construction, No. = number.

^a Canceled on 10 March 2003.

C. Project Data

1. Project Cost (\$ million)

| Cost | Appraisal Estimate | Actual |
|-----------------------|--------------------|--------------|
| Foreign Exchange Cost | 74.0 | 49.5 |
| Local Currency Cost | 86.0 | 68.0 |
| Total Cost | 160.0 | 117.5 |

\$ = US dollars.

2. Financing Plan (\$ million)

| Cost | Appraisal Estimate | | | Actual | | |
|----------------------|--------------------|----------------|--------------|------------------|----------------|--------------|
| | Foreign Exchange | Local Currency | Total | Foreign Exchange | Local Currency | Total |
| Implementation Costs | | | | | | |
| Borrower-Financed | 10.6 | 76.8 | 87.4 | 0.0 | 62.6 | 62.6 |
| ADB-Financed | 60.2 | 0.0 | 60.2 | 45.7 | 0.0 | 45.7 |
| Subtotal | 70.8 | 76.8 | 147.6 | 45.7 | 62.6 | 108.3 |
| IDC Costs | | | | | | |
| Borrower-Financed | 0.4 | 9.2 | 9.6 | 0.0 | 5.4 | 5.4 |
| ADB-Financed | 2.8 | 0.0 | 2.8 | 3.8 | 0.0 | 3.8 |
| Subtotal | 3.2 | 9.2 | 12.4 | 3.8 | 5.4 | 9.2 |
| Total | 74.0 | 86.0 | 160.0 | 49.5 | 68.0 | 117.5 |

ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown by Project Component (\$ million)

| Item | Appraisal Estimate | | | Actual | | |
|---------------------|--------------------|----------------|--------------|------------------|----------------|--------------|
| | Foreign Exchange | Local Currency | Total | Foreign Exchange | Local Currency | Total |
| Project Preparation | — | 15.6 | 15.6 | 0.0 | 17.7 | 17.7 |
| Civil Works | 30.3 | 38.6 | 68.9 | 18.5 | 44.3 | 62.8 |
| Equipment | 29.2 | 1.6 | 30.8 | 26.8 | 0.1 | 26.9 |
| Consulting Services | 0.5 | 0.5 | 1.0 | 0.4 | 0.5 | 0.9 |
| Contingencies | 10.8 | 16.6 | 27.4 | 0.0 | 0.0 | 0.0 |
| IDC | 3.2 | 9.2 | 12.4 | 3.8 | 5.4 | 9.2 |
| Taxes and Duties | 0.0 | 3.9 | 3.9 | 0.0 | 0.0 | 0.0 |
| Total | 74.0 | 86.0 | 160.0 | 49.5 | 68.8 | 117.5 |

— = no data available, \$ = US dollars.

IDC = interest during construction.

4. Project Schedule

| Item | Appraisal Estimate | Actual |
|-----------------------------------|--------------------|----------------|
| Date of Contract with Consultants | Not recruited | Not recruited |
| Completion of Engineering Design | September 1995 | September 1996 |
| Civil Works Contract | | |
| - Date of Award | January 1996 | August 1997 |
| - Completion of Work | December 1999 | October 2001 |
| Equipment and Supplies (dates) | | |
| - First Procurement | January 1998 | September 1998 |
| - Last Procurement | December 1999 | March 2001 |
| - Completion of Installation | December 1999 | December 2001 |
| - Start of Operations | December 1999 | December 2001 |

5. Project Performance Report Ratings

| Implementation Period | Ratings | |
|---------------------------------|------------------------|-------------------------|
| | Development Objectives | Implementation Progress |
| (i) From Dec 1998 to Dec 1999 | S | S |
| (ii) From Jan 2000 to Feb 2001 | S | S |
| (iii) From Mar 2001 to Jun 2001 | S | HS |
| (iv) From July 2001 to Dec 2002 | S | S |

HS = highly satisfactory, S = satisfactory.

D. Data on Asian Development Bank Missions

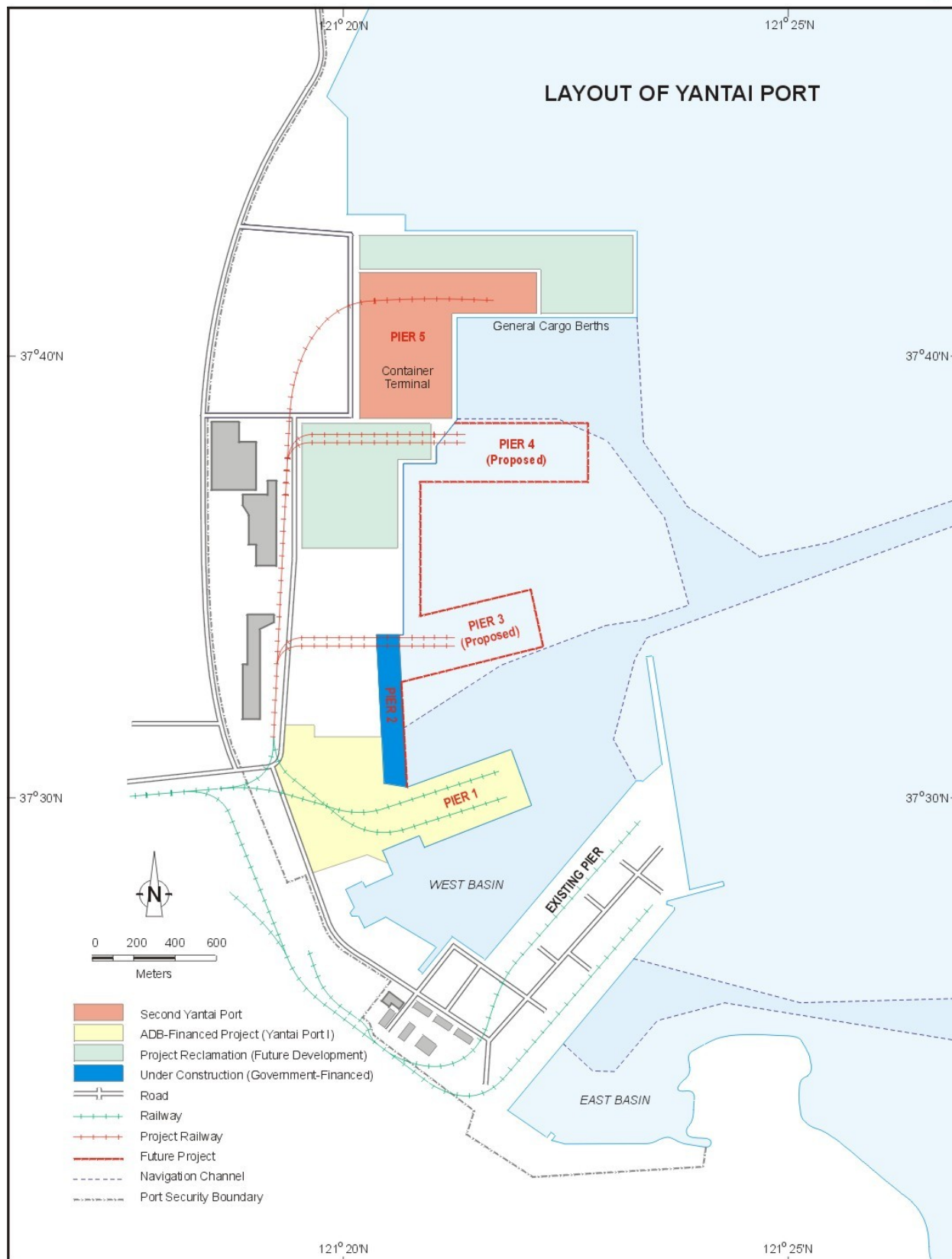
| Name of Mission | Date | No. of Persons | No. of Person-Days | Specialization of Members ^a |
|--|-------------------|----------------|--------------------|--|
| Fact-Finding | 12–28 Jan 1995 | 6 | 90 | a, b, f, e, g |
| Appraisal | 3–24 May 1995 | 5 | 132 | a, b, c, d, e |
| Inception | 30 Jan–3 Feb 1996 | 1 | 5 | a |
| Review 1 | 9–11 Dec 1996 | 2 | 6 | a, h |
| Review 2 | 26–28 Jul 1997 | 2 | 6 | a, h |
| Review 3 | 3–6 Nov 1997 | 1 | 4 | a |
| Review 4 | 16–20 Nov 1998 | 3 | 15 | a, b, h |
| Review 5 | 6–9 Sep 1999 | 2 | 8 | a, h |
| Review 6 | 24–26 Nov 1999 | 3 | 6 | a, b |
| Review 7 | 24–30 Apr 2001 | 2 | 14 | a, b, h |
| Review 8 | 24 Sep–1 Oct 2002 | 1 | 9 | a |
| Project Completion Review ^b | 7–10 October 2003 | 3 | 30 | a, d, h |

No. = number.

^a a = engineer; b = financial analyst; c = counsel; d = economist; e = programs officer; f = environment specialist; g = young professional; h = assistant analyst.

^b The Mission comprised K. Jraiw, Transport Specialist (Mission Leader); E. Kwon, Project Economist; and E. Infante, Assistant Project Analyst; and staff consultant. The Mission was assisted by H. Sakurai, Financial Specialist, at headquarters.





I. PROJECT DESCRIPTION

1. Economic reforms undertaken in the People's Republic of China (PRC) since 1978 resulted in the rapid development of the areas surrounding ports, which generated increased volumes of trade and necessitated the expansion of port capacities to cope with the increase in traffic and improve efficiency. To cope with the increased demand for transport services and remove road network constraints, the Government launched in 1991 a 30-year program to build a 35,000-kilometer high-grade national trunk highway system (NTHS) network that will comprise five north-south expressway corridors and seven east-west expressway corridors. The NTHS will connect all major provincial capitals and other cities with populations of over 500,000. A similar program was launched to improve port operations. The ports program will provide access and service to underdeveloped areas and poor hinterland communities, thus strengthening their links to the mainstream economy and associated markets. In the ports sector, the Government's policy comprised increasing port capacity, modernizing port facilities, and overcoming congestion in port approaches by deepening channels and improving interface connections with land transportation networks.

2. The Second Yantai Port Project's principle objective is to support the hinterland's continuous rapid economic development, particularly that of Shandong province, by improving the capacity and efficiency of Yantai port.¹ The Project covers (i) the construction of two container berths that are capable of handling 15,000 deadweight tons (dwt) and 30,000 dwt, respectively; two conventional cargo berths that are capable of handling 15,000 dwt and 20,000 dwt vessels, respectively; and related facilities; (ii) the procurement of container and other cargo handling equipment, port service vessels, and various vehicles; and (iii) the training of staff members in port management, construction administration, and plan development.

3. The Project's feasibility study was completed in 1994 and reviewed under Asian Development Bank (ADB) technical assistance.² ADB approved a \$63 million loan from its ordinary capital resources on 12 December 1995, to finance 39% of the Project's total \$160 million cost. The Loan Agreement was signed on 11 December 1996 and declared effective on 11 March 1997. The loan closing date was set for 30 June 2000 but extended once to 30 June 2002, to overcome the initial delay in implementation and complete the remaining civil works and procurement of equipment. The actual loan closing date was 10 March 2003, due to a delay in the refund of the unused imprest fund. Map 1 gives the port's location and Appendix 1 contains a chronology of major events related to the Project.

4. The Project achieved its objective within the cost estimated at appraisal. The Project's scope remained generally unchanged from that envisaged at appraisal, except for the additional dredging of the port's approach channel from -11.5 meters to -14 meters and the additional procurement of a 50-ton multipurpose gantry crane approved by ADB to enhance port operations.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

5. Rapid socioeconomic development in the PRC is straining all of the country's transport modes and is being addressed by the development of key port areas, road corridors, and

¹ ADB. 1996. *Report and Recommendation of the President to the Board of Directors on the Proposed Loan to the People's Republic of China for the Second Yantai Port Project*. Manila.

² ADB 1993. *Technical Assistance to the People's Republic of China for the Second Ports Development Project*. Manila.

railway networks. The Yantai port's hinterland includes Shandong province and the provinces of Henan, Hebei, Shanxi, and Shaanxi, which are among the poorest in the PRC. The primary hinterland of Yantai port consists of the Yantai area, with a population of about 6.5 million in 2002, and northern Shandong province, which is lined by the port and the north Shandong transport corridor. The three strategic objectives of ADB's operations in the PRC were (i) economic efficiency, (ii) poverty reduction, and (iii) environmental protection and resource conservation. In the ports sector, the priority was to mobilize capital resources to finance the construction of additional berths, install modern cargo handling facilities and equipment, and make transport and distribution in the hinterland more efficient through integrating transport networks and restructuring institutions.

6. ADB has supported the Government's policy on integrated transport sector development and the Government's program on the implementation of port projects since 1991. The principles of ADB's strategy for port restructuring in the PRC remain basically the same, namely remove infrastructure constraints and support policy and institutional reform. The policy dialogue undertaken with the Government at appraisal concentrated on the following: (i) developing integrated trade arrangements to facilitate efficient distribution in inland areas, mainly by addressing logistics, such as different modes and electronic data interchange controls at ports; (ii) linking more efficiently ports to their hinterlands and national transportation corridors by selective investment in complementary infrastructure (national highways, national railways, and inland waterways); and (iii) supporting the emergence of competition between ports at the overlapping margins of port hinterlands.³

7. The Project's design was generally sound and the formulation process was adequate. Stakeholders were consulted by means acceptable to ADB before and during the Project's planning, designing, and implementing phases. The project scope was determined in consultation with the central Government and various provincial government departments, interested groups, and local leaders. The implementation arrangements devised under the technical assistance (footnote 2) were satisfactory. The Project's technical and quantifiable benefits consist of reduced ship time in port, minimized cargo handling costs, and increased capability.

8. The Project was developed in the context of a wider government strategy to reduce poverty, which is also supported by ADB through its country strategy. The Project will increase income-generating opportunities for the poor by improving access to market-oriented activities and economic wealth, social and educational services, and basic health care.

B. Project Outputs

9. Project components were fully completed as appraised. The scope of project components at appraisal and the works executed (Appendix 2) included

- (i) Civil works: constructing a dedicated container terminal with two container berths capable of handling vessels of 15,000 dwt and 30,000 dwt, respectively; constructing two conventional cargo berths with vessel capacities of 15,000 dwt and 20,000 dwt, respectively; dredging the port's approach channel and ship turning basin; expanding rail marshalling facilities; constructing other auxiliary

³ The criteria were based on the outcome of a 1993 international seminar on port investment and competition that was financed by ADB as a component of an earlier technical assistance undertaking and described in *Port Management and Operations* (ADB. 1991. *Port Management and Operations*. Manila.).

utilities, such as water and power supply facilities; constructing road buildings and a storage yard and port buildings.

- (ii) Equipment: procurement of cargo and container handling equipment, computerized control equipment for container operations, and harbor crafts and vehicles.

C. Project Costs

10. The final cost of the Project's ADB-financed component at completion was \$49.5 million, compared with \$63.0 million at appraisal. The Project was estimated at appraisal to cost \$160.0 million, including contingency fees and interest and other charges during construction. The foreign exchange cost was \$74.0 million (46%), and the local currency cost was \$86.0 million (54%). The actual project cost is now \$117.5 million, with a foreign exchange cost of \$49.5 million and a local currency cost of \$68.0 million. A summary of the financing plan and funds available is shown in Appendix 3.

11. The Project realized savings in actual costs over appraisal estimates. In 2000, the Yantai Port Authority (YTPA) submitted an additional procurement proposal to ADB to use some of the savings (\$10.2 million). The objectives were to further deepen, from -11.5 meters to -14.0 meters, and widen the approach channel and turning basin and procure a multipurpose quayside gantry crane (50-ton), to cope with large ore carriers. The gantry crane would be used instead of two quayside portal cranes and 10 mobile cranes (16–25 tons) that were previously included in the Project. The proposal was approved by ADB in May 2000. Eventually, the remaining savings from ADB loan proceeds (\$13.5 million) were cancelled in two stages. Ten million dollars was cancelled by YTPA in September 2001, and an undisbursed amount of \$3.5 million was cancelled in March 2003, during loan closure. The main savings were in civil works, port equipment, and unused contingency fees. The major causes of the savings were (i) lower equipment costs, as a result of the competitive bidding process; (ii) unused contingency fees; and (iii) overestimation during appraisal.

D. Disbursements

12. Loan proceeds were disbursed in accordance with ADB guidelines on loan disbursement. The Executing Agency's accounting staff received international and domestic training in financial planning and management procedures, as part of the Project's ADB-financed component. The total amount of disbursements, prior to the loan closing date, was \$49.5 million. Most of the contracts for project goods and services, including international training, were disbursed under direct payment procedures. The disbursements were made on a timely basis. The performance in the use of the imprest account was satisfactory during the implementation period. Imprest account liquidation was conducted smoothly and did not delay the loan closing date.

E. Project Schedule

13. The total implementation period was scheduled to be 4 years, from 1997 to 1999. Project completion was planned for 31 December 1999. The loan closing date was originally set on 30 June 2000. Port construction commenced on 8 August 1997. The Project's master works (marine structure and dredging) were completed on 7 December 2001, at which time the largest pieces of handling equipment (quayside container cranes) and facilities began full operation. The port's implementation fell behind the scheduled envisaged at appraisal by 24 months, due to the following: (i) the delay in signing the Loan Agreement; (ii) the need to further enhance the

port's capacity to accommodate large vessels; (iii) the need to strengthen the port's position to compete with neighboring ports; and (iv) the need to use partial loan saving to enhance port operations. A summary of the equipment procured and civil works packages is in Appendix 4.

F. Implementation Arrangements

14. YTPA was responsible for overall project coordination and implementation and acted as the Executing Agency and main liaison with ADB. A project management office (PMO), known as the Port Construction Headquarters, was officially established within YTPA prior to project commencement. The PMO was headed by a port director and comprised the competent technical, administrative, and supporting staff members necessary to ensure the Project's smooth implementation. Key PMO personnel were fully trained in ADB procedures relating to project administration, procurement, and disbursement and received various types of international training. A total of 7,174 people were employed to run Yantai port.

15. The Project's international procurement was undertaken by a tendering company, following the modes and procedures approved by ADB. Since the Project involved the second ADB loan for Yantai port, the Executing Agency previously acquired a relatively adequate amount of international project implementation experience in international competitive bidding, port engineering, financial management, and human resources development.

16. The People's Bank of China also provided project supervision and coordination. But under the institutional reform that took place in 1998, supervision and coordination were transferred to the Ministry of Finance. The Ministry of Communications (MOC) was responsible for project construction and training. All training programs were checked and approved by MOC. The implementation arrangements were adequate and played a significant role in achieving project targets. Actual and envisaged schedules are compared in Appendix 5.

G. Conditions and Covenants

17. The loan covenants were generally complied with, except for the financial covenants. YTPA was required to maintain a ratio of total working expenses to total operating revenue of not higher than 55% and earn and maintain an annual return on net fixed assets (in operation) of not less than 7%. Throughout the implementation period, the financial performance of YTPA did not satisfy these covenants. YTPA did not satisfy these covenants because (i) to cope with the tough competition among the neighboring ports, YTPA had to adopt a relatively low tariff to maintain its market share; (ii) to enhance the capacity of port facilities, YTPA invested a total of CNY192 million in the construction of a new container berth and a new conventional berth; and (iii) to further improve the port's operation and management, YTPA also invested in the modernization of the management information system and computerized control center. According to forecasts, YTPA will meet the stipulated financial covenants by 2005. Details of compliance status are shown in Appendix 6.

18. YTPA's financial statements and the FY2002 project account statement, which were due on 30 June 2003, were not submitted to ADB. However, the submission of the 2003 audit reports were not required, because only a few small transactions in the training component were undertaken through the imprest account during 2002. These were substantiated and liquidated when closing the imprest account in 2003. In addition, the loan's outstanding balance was fully prepaid in May 2003, and financial figures for 2002 that were not audited were supplied to ADB during the Project Completion Review Mission.

H. Related Technical Assistance

19. The Project was formulated under a project preparatory technical assistance activity (footnote 2). The technical assistance scope included (i) a review of the port subsector in the PRC, (ii) a review of the Project's scope and feasibility, and (iii) a review of the environmental impacts of the proposed investments. Advisory technical assistance for management and operational strategies for port authorities also complemented the Project.⁴ The advisory technical assistance scope included (i) a review of the port subsector in the PRC, (ii) a review of the Project's scope and feasibility, and (iii) a review of the environmental impacts of the proposed investments. A contract was awarded to a United Kingdom-based consulting firm on 19 December 1997. Under the technical assistance, consultants recruited by ADB assisted in the Container Terminal Operation Plan's preparation and implementation, as part of time-bound management and operational strategies, and a national conference was convened in January 1999 in Beijing. The technical assistance significantly assisted the Government in establishing a framework for a management and operational strategy, the Container Terminal Operations Plan, a staff-training program, and a national conference on container operations and management strategies. All technical assistance items were implemented with the assistance of ADB staff and a consultant team. The project preparatory technical assistance was completed in 1995, while the advisory technical assistance final report was submitted in 1999. Both technical assistance undertakings were rated successful. The technical assistance completion report for the accompanying technical assistance is in Appendix 7.

20. Following the technical assistance, the Executing Agency submitted to ADB in 1999 and implemented the Port Management Reforms Action Plan. The process of listing the ferry passenger terminal as a joint-stock company began at that time. However, the central Government created a major reform in the ports sector in August 2002 that resulted in the transfer of YTPA from MOC to a local government authority and created a need for more requirements. The full progress of listing the terminal as a joint-stock company, therefore, will be subject to the completion of all transfer processes and local government approval. YTPA will inform ADB of this matter, once progress is made.

I. Consultant Recruitment and Procurement

21. ADB approved in April 1995 an advance procurement action for the procurement of port construction equipment and engagement of an individual consultant as procurement adviser. The domestic consultant was retained to carry out the port's detailed design and construction supervision. Contracts for materials and equipment were procured in accordance with ADB's *Guidelines for Procurement*. Most of the contracts were procured through international competitive bidding or international shopping, depending on the contract amount. Part of the equipment package was revised after discussions between the Executing Agency and ADB. All equipment was delivered and installed.

22. The procurement of civil works was implemented through international and local competitive bidding. The international competitive bidding mode was employed in marine and dredging works. For other civil works, local competitive bidding was adopted, and contracts were awarded to several domestic contractors.

⁴ ADB. 1995. *Technical Assistance to the People's Republic of China for the Management and Operational Strategies for Port Authorities*. Manila.

J. Performance of Consultants, Contractors, and Suppliers

23. The performance of consultants, contractors, and suppliers under the Project was considered satisfactory, with no particular problem during project implementation. In line with the appraisal, the Project's consulting services were procured through local competition. Two domestic firms were selected. One domestic firm carried out the feasibility study and detailed design, and the other firm supervised construction.

24. Project supervision was legal, honest, scientific, and fair. The supervisor established on-site the Supervision Division of the Second Yantai Port Project, which comprised 5 working groups (i.e., Marine Works Supervision Group, Civil Works Group, Stockyard Group, Water Supply and Drainage Group, and Equipment Group). A chief supervision engineer was designated for overall project supervision. This individual contributed greatly to ensuring the Project's efficient, proper, low-cost, and timely implementation and completion.

25. During project implementation, contract terms and conditions were strictly complied with by all contractors to ensure smooth implementation progress and good quality construction works, the costs of which fully met the requirements stipulated in the bidding documents. There were no quality problems or major contractual disputes.

26. The completion of project equipment contracts was generally smooth. Most suppliers performed satisfactorily and delivered the needed equipment as per contractual requirements. Although there were some delivery delays, the installation of equipment was not affected and was completed as scheduled.

K. Performance of the Borrower and Executing Agency

27. The Borrower met all project requirements. The Project was implemented smoothly, following the arrangements envisaged at appraisal. The Project's smooth and timely execution benefited much from ADB's great concern and support. Since the Project is the second ADB loan to YTPA, the Executing Agency acquired sufficient knowledge and experience in project implementation, international procurement, engineering expertise, financial management, and human resources development. This experience greatly contributed to the Project's timely implementation.

L. Performance of the Asian Development Bank

28. ADB's performance in completing the Project was satisfactory. During the Project's loan implementation period, from preparation to completion and operation, ADB provided significant help and paid significant attention to the Project. In addition to a staff development program, ADB conducted training and seminars that provided very good opportunities to advance the Executing Agency's staff awareness of ADB procedures and policies and removed several obstacles to implementation. The implementation arrangements were appropriate to project needs, and the use of loan savings allowed additional works that enhanced the Project's level of service. The number of ADB's review missions was adequate. The missions had a good impact on the Project's efficient implementation and greatly contributed to the Project's successful completion.

29. During the Project's early stages, ADB sent a consultant team, comprising experts in the fields of port technology and finance, to Yantai port to carry out an overall assessment.

The team made recommendations regarding technology and institutions and a follow-up project that were widely adopted and proved to be helpful in project implementation.

30. ADB's procurement guidelines and project implementation procedures played an essential part in the Project's smooth execution and, especially, the preparation of bidding documents and the bid evaluation.

31. Taking into account the practical situation, and upon the request of the Executing Agency, proper adjustments were made on time by ADB to the contract packages, to ensure the Project's smooth progress.

III. EVALUATION OF PERFORMANCE

A. Relevance

32. The Project was consistent with ADB and government priorities at appraisal and remains consistent with current priorities. The Project benefits the community by improving the capacity and efficiency of Yantai port and promoting the hinterland's continuous rapid economic development, particularly that of Shandong province (Appendix 8). As estimated at appraisal, project implementation met the following objectives: (i) providing bulk cargo and container facilities for the port's hinterland to improve the operational efficiency of Yantai port and increase the port's handling capacity; (ii) easing the hinterland's traffic congestion and enabling the efficient movement of goods; (iii) developing human resources to strengthen institutions responsible for port construction, management, and operations; and (iv) developing the hinterland's economy to create more employment opportunities and raise the people's living standards. The Project is therefore rated highly relevant.

B. Efficacy in Achievement of Purpose

33. The Project generally achieved the physical targets set at appraisal and is expected to realize the wider development goal envisaged at that time. New terminal construction had a significant impact on the hinterland's economic development (Appendix 8).

34. The Project was completed at the end of 2001. In FY2002, YTPA registered a significant cargo throughput of 26.89 million tons, against the revised ADB projection of 20.30 million tons.⁵ This represents an outstanding growth of about 22.8% over 2001 figures. The container throughput also showed significant growth in 2002. The 2002 throughput was 160,000 twenty-foot equivalent units (teu), compared with 120,000 teu in 2001, but this was lower than ADB's projection of 200,000 teu.

35. Container business infrastructure was greatly improved by project facilities that became fully operational by the end of 2001. The newly dredged channel and turning basin and new project terminals increased port handling capacity, and the increased capacity attracted an increased number of large-sized vessels.

36. The continuously high growth of port traffic since 2001 was the result of the improvement of port facilities and active marketing measures undertaken by YTPA. In 2001, YTPA

⁵ ADB fielded the special Loan Administration Mission in November 1999, which undertook extensive consultations with MOC, the Ministry of Finance, and YTPA. The Mission thereafter revised the monitoring indicators and traffic and productivity targets made at appraisal. The Mission also revised the cargo forecast made at appraisal, in light of falling traffic resulting from the 1997 Asian financial crisis.

successfully made a bid to handle coal export orders and also made new business explorations into importing timber, sulfur, and steel scrap (Appendix 9). In addition, YTPA operated new container shipping lines to Hong Kong, China; Republic of Korea; and Taipei, China.

37. YTPA recently concluded negotiations with two container shipping companies that will start regular services from Yantai to Japan and is also negotiating with another shipping company to increase the frequency of regular service from the Republic of Korea. These companies will add at least 40,000 teu to the port's present traffic. Regular services between Yantai and Inchon and Yantai and Dalian have begun. These services contributed to the increased number of ships calling at the port during 2002, compared with 2001.

38. The port is in an advantageous position to capture most of the cargo originating from Yantai's new Export Promotion Zone (EPZ), which is located next to the port. The EPZ formally began operating in January 2001. This is the only processing zone in the PRC with direct access to port facilities, and the port will provide excellent shipping opportunities for the 70 enterprises located in the zone. These enterprises alone will add over 50,000 teu of container cargo and nearly 1 million tons of bulk and/or break bulk cargo per annum.

39. In its first fully operational year (2002), the Project's container berths handled 910,000 tons (99,000 teu), and the Project's general cargo berths handled 4.76 million tons. According to predictions, the total 2003 throughputs at project berths will reach 1.74 million tons (190,000 teu) and 6 million tons for container and general cargo, respectively. The Project's berths help relieve deepwater berth congestion and increase handling efficiency.

40. A powerful marketing strategy was undertaken by YTPA, and this strategy will hopefully contribute to port traffic's steady future growth. YTPA is confident that the positive traffic growth trend can be maintained and that more cargo can be brought to the port. The traffic forecast for 2004 will be 38.72 million tons (compared with 25.23 million tons at appraisal); while the 2005 forecast will be 46.47 million tons, compared with less than 27.81 million at appraisal. In 2010, the Project's container berths will reach their designed capacity of 300,000 teu, while the general cargo berths will reach their designed capacity of 7 million tons in 2005 (Appendix 10).

41. Yantai port is in a better position to consolidate its strengths for competition and take advantage of its favorable geographic location when attracting more cargo, following the PRC's World Trade Organization accession. The Project was therefore rated highly efficacious.

C. Efficiency in Achievement of Outputs and Purpose

1. Financial Performance

42. The YTPA's financial performance was assessed in comparison with the appraisal projection (Appendix 11). The appraisal projection was prepared in the aftermath of the yuan devaluation, which occurred during the inflationary economy, with a high growth prospect. Traffic growth was steady but adversely affected by recent economic development in two ways: (i) the Asian financial crisis decreased foreign trading volume, and (ii) increased competition among PRC ports pulled the tariffs down. Two sets of financial covenants (working ratio and return on net assets in operation) were not met during the implementation period (from 1997 to 2002). Overstaffing in YTPA, which had more than 8,000 employees, further trimmed YTPA's profitability. In 2000, a strategic decision to deepen the water level required additional capital expenditure at the most difficult time for YTPA. ADB supported this decision in 2000, as a major change of project scope, and encouraged the Port Management Reforms Action Plan's

implementation and the restructuring of port businesses. This decision resulted in a positive outcome. Since 2001, port traffic recovered significantly. Growth of foreign container handling accelerated through efficient use of project and other berths, which resulted in an optimal turnover of port assets. The PRC's World Trade Organization accession in December 2000 further provided YTPA with new opportunities to expand its businesses.

43. While traffic shows a positive outlook, competition with other domestic ports has increased. Bargaining and dumping of cargo handling fees have brought on a significant tariff reduction in real terms during recent years. The reduction will add some vulnerability to the financial performance of YTPA. However, YTPA will capitalize on its strengths (quality and efficiency of services) rather than tariffs, through implementing the Port Management Reforms Action Plan and investing in the state-of-the-art machinery and facilities that will enable YTPA to complete more effectively. The effects of such an action plan—including a separation of social infrastructure and a reduction of personnel, together with the results of capital works for capacity expansion—are likely to translate to better financial performance in the near future.

44. Project berth financial internal rate of return (FIRR) was reevaluated using the same methodology used at appraisal, but the reevaluation was based on actual costs and updated assumptions (Appendix 12). The reevaluated FIRR is 8.1%, which compares with 4.4% of the weighted average cost of capital (WACC). Compared with 7.2% of the appraisal FIRR, 0.9% of the increase mainly accounts for the lowered capital cost (by 25%) and the upward traffic forecast for project berths. A sensitivity analysis and the probability of losing financial viability were assessed and found satisfactory. The Project is therefore considered financially viable.

45. Port component FIRR was reevaluated using the same methodology used at appraisal, but the reevaluation was based on actual 1997–2002 costs and revenues. The reevaluated FIRR for the port component is 6.90%, against 5.20% of the WACC. Compared with 7.25% of the appraisal FIRR, 0.35% of the decline resulted from lowered tariffs. Exceeding its WACC, the Project is considered financially viable (Appendix 12).

2. Economic Performance

46. Following the methodology used at appraisal, the economic costs and benefits of the with and without project cases were reevaluated. The benefits were recalculated using actual 2002 port traffic and newly forecasted traffic for future years. Incremental operating and maintenance costs were also adjusted to reflect economic costs using the same approach. Actual capital cost was about 27% lower than that at appraisal, due to cost savings in contingency fees and civil works. Operating cost was about double that at appraisal, due to a much higher throughput at project berths. The Project's principal economic benefits are (i) avoided transportation costs and (ii) saved ship turnaround time. According to assumptions, 80% of container traffic and 30% of conventional cargo traffic would be diverted to road transport. Time savings were calculated based on actual time spent in berths and for waiting time at anchor while awaiting berths.

47. The Project's economic internal rate of return (EIRR) was reevaluated on the basis of 20 years of operation after project start-up, or an evaluation of period of 25 years (1996–2021). At appraisal, the EIRR was calculated at 18.5%. The Project's EIRR was recalculated at 17.6% (Table A13). The slightly lower EIRR, compared with the appraisal evaluation, was mainly due to the 3-year project operation delay and the doubled operating cost, compared with that at appraisal. A sensitivity analysis indicated that the Project continues to be economically viable under appraisal scenarios. If the benefits were reduced by 10.0% and 20.0%, due to certain

reasons, the EIRR would be 15.6% and 13.5%, which would still be above the cutoff rate of 12.0%. Overall, in economic terms, the Project was well justified (Appendix 13). Overall, the Project is rated as highly efficient.

D. Preliminary Assessment of Sustainability

1. Policy Reform

48. A law to reform the PRC's port sector was identified by ADB as an essential requirement, and this law was incorporated as a covenant in three port projects (Yantai, Xiamen, and Fangcheng) that were approved in the 1990s. As a result, the PRC's top legislature, the Standing Committee of the National People's Congress, passed a law on port administration in June 2003 to upgrade the construction, management, and competitiveness of the country's sea and river ports. Scheduled to be in effect on 1 January 2004, the law sets out new legal competencies of local governments with jurisdiction over ports and companies running ports. The central Government will merely play the role of supervisor and coordinator, and companies will run ports in accordance with market principles, in a transparent and unbiased manner.

49. All PRC ports have to undergo related administrative restructuring before the end of 2003. The Government opened its ports to overseas investment in 2002, and the new legislation will open the door even wider. The PRC has 1,467 ports, including 165 seaports and 1,302 river ports. ADB investment in the sector during the 1980s and 1990s was about \$300 million, to strengthen the capacity of six ports. Currently, PRC ports handle 9% of domestic cargo transport and 85% of foreign trade cargo. Given the rapid growth of the PRC's foreign trade, ports are expected to see an annual increase of 10% in freight volume, rising from the current 1.6 billion tons to 2.0 billion tons in 2005. Given this rapid growth trend, the law will help tighten government supervision and improve port administration and operations. YTPA completed its transfer from MOC to local government responsibility and will benefit significantly from the new law.

50. YTPA made good progress in the Port Management Reforms Action Plan's implementation, which YTPA submitted to ADB in 1999. The process of listing the ferry passenger terminal as a joint-stock company has begun, and the endorsement of the listing is now under consideration by the local government, in accordance with the new law. The EPZ adjacent to the port has been fully operational since the end of 2001. The first batch of 70 EPZ enterprises is using the port for all their import and export activities.

51. The marketing of port services is being aggressively pursued. YTPA formed some joint ventures with a Singapore-based enterprise that established a food oil processing plant near the port. The plant started production in June 2002, with a capacity of 1,800 tons per day. With the completion of the plant's second stage (end of 2004), the daily capacity will increase to 3,200 tons per day, increasing the current traffic of 650,000 tons per annum for import and 400,000 tons per annum for export to a throughput of 2 million tons per annum and an annual benefit of over CNY50 million. Another foreign company (a fertilizer processing and marketing business) has also started operating, creating annual traffic of 400,000 tons and a benefit of around CNY20 million. Negotiations are now in the final stage with a major US company to facilitate the import of 400,000 tons of oil products per annum. YTPA's successful joint-venture activities will add further traffic and better productivity. YTPA has also entered into a joint-venture agreement with a major US container shipping company, to strengthen the container operations at existing and new berths. The Government approved the joint venture's business license in September 2003, and the joint venture will be put into operation in the very near future.

52. YTPA introduced open competition and a merit system in the appointment of staff and management cadre in 2001. Several of the younger professionals were promoted to various senior positions. Competition with external applicants was also introduced. Substantial steps were undertaken to streamline the present accounting system, including the adoption of best practice, new accounting software, and financial management. YTPA established a partnership with an information technology company (Huadong Electronic Technology) to continually update its computerized systems and software and promote staff development, to strengthen port planning, management, and operations. YTPA increased the inventory from CNY29 million to CNY35 million in 2003, to establish a profitable machinery spare parts system (e.g., stocking water pump and specialized equipment parts). This system will generate further profit through external sale and enhance the port's maintenance system.

53. YTPA is working toward a landlord port model, to introduce dedicated cargo terminals functioning as separate cost and/or profit centers within the present port administration system. Following the container terminal initiative's success, YTPA is now planning to implement this concept in the grain terminal. YTPA started the process of disposing of their secondary business activities, such as schools, hospitals, etc. The hospital was provided through a grant during its first year of operation and became an independent entity in 2001. The hospital is now open to the public. Schools will be independent, and open to the public in 2004. The old housing welfare system was abandoned, and all its apartments were sold to employees.

54. Two major Chinese shipping companies and over 60 agents of various overseas and domestic companies are now operating in the port and Yantai city, reflecting the increasing confidence in the port's reform and services. YTPA obtained International Organization for Standardization (ISO) certificates in some port businesses, such as the handling of fertilizer and bulk grain. Efforts are made to further improve port operations and management in accordance with ISO standards.

2. Risks

55. As formulated at appraisal, the Project does not face any risks. YTPA has adequate technical resources, institutional capacity, and revenue growth and profit, and there is no significant debt service obligation. Rapid growth in the port and project area and development of efficient road and railway networks will ensure an adequate demand for the facilities provided under the Project. There is good potential for port product sales and operations improvement. Hence, the sustainability of the Project is most likely.

E. Environmental, Sociocultural, and Other Impacts

1. Environmental Impacts

56. Environmental monitoring is being implemented by YTPA, as required.

57. During the Project's design and implementation, state environment protection regulations were strictly complied with. In this regard, no construction works could be started before the completion of environmental appraisals. The design, implementation, and operation of environment protection facilities were carried out simultaneously with main works. All the environmental facilities were completed pursuant to designs and have passed the acceptance inspection undertaken by national authorities.

58. The port's wastewater is channeled to the municipal wastewater treatment plant, which has a treatment capacity of 200,000 tons per day, and the plant has sufficient capacity to cater to the port's water treatment needs. The wastewater generated by container washing and port runoff is primarily treated by passing this water through a settlement tank facility at the port, prior to pumping the wastewater to the municipal treatment plant for secondary treatment. Vessels' oil-tinged water is fully treated by a special treatment vessel named "Jiehai" (the name means "cleaning the sea") before being discharged.

59. The Executing Agency maintains the berth area in an organized and clean manner. The berth area is observed to be free from dust and suspended particles, even during bulk cargo operations. To strictly control air pollution, the four sets of coal-combustion boilers (4 tons per set) procured under the Project were replaced by one 1.4-megawatt oil-combustion boiler. The new boiler has reduced to a minimum smoke, dust, and coal cinder pollution in the port area. Dustbins are strategically located in the port area for garbage collection. Garbage is sent to the municipal refuse treatment plant for disposal and treatment. To achieve the lowest level of noise pollution, all equipment procured under the Project is required to meet low noise operation level standards and comply with the state's relevant noise control standards. In addition, greening and beautification work was undertaken for all open space. A green space of about 3,000 square meters was completed, contributing greatly to dust and noise pollution reduction and the port's aesthetic beauty.

60. To further improve personnel qualifications in environmental fields, the Executing Agency recruited more experienced technicians. In addition, eight sets of environment monitoring equipment were put into operation in 2001, to strengthen environment protection and management.

2. Resettlement

61. About 109 families (300 people) were resettled as a result of the relocation of the marine, aquaculture, and fishing vessel repair yard. The Government compensated adequately the affected persons. In accordance with government guidelines, additional job opportunities were provided, and a cleaner environment was created. Overall, resettlement had a positive social impact. No other negative impacts were experienced due to project-associated activities.

3. Occupational Health and Safety

62. For the sake of employees' health and safety in the port's operations areas, all necessary safety facilities were installed in compliance with the relevant government regulations. The equipment procured under the Project was provided with certificates of quality. All operations staff are trained before they are allowed to operate the equipment. Appropriate lighting was installed in the yard and along the road, and lightning guards were installed on buildings and big equipment. Buildings were constructed strictly with safety communication space intervals. Roads in the port area are wide. Obvious traffic signs and administrative facilities are installed at railway crossings and road bends. Reliability and noise abatement measures were among the main considerations during equipment selection. Wind speed, alarming devices, rail clamps, and anticollision devices were installed for tall and large pieces of equipment, to ensure safety.

63. Prescriptions concerning day lighting, adequate heating, and proper ventilation for buildings were complied with. The port's approach channel and harbor basin are suitable for vessel navigation and equipped with reasonable and safe navigation guiding and aiding

facilities. The Project's occupational health and safety facilities were inspected and accepted jointly by the State Economic and Trade Commission's Safe Operation Supervision and MOC on 7 December 2001.

F. Project Operations

1. Capacity Building

64. With ADB's approval, YTPA successfully organized nine overseas training groups for short courses in Asia, Europe, and the US. These training courses significantly improved the skills of the port's staff.

65. During project implementation, the Executing Agency learned much through the successful procurement of equipment and civil works. This experience played an important role in the development of other projects within the port area.

66. Staff training provided and the efficient execution of project implementation procedures advanced the engineering, financial, and management capabilities of the technical staff. This improved the efficiency of Yantai port's management and operations. Overall, ADB's performance is therefore considered highly satisfactory.

2. Project Facilities

67. Project facilities commenced operation at the end of 2001, and the Executing Agency has started deriving benefits from the Project. The Executing Agency fostered port-related industrial economic development in this region.

68. For instance, with the help of the new project facilities and with the State Council's approval, the Yantai EPZ was established adjacent to the Project's site and formally began operating in January 2001. This EPZ is the only processing zone in the PRC with direct access to port facilities. The Project, therefore, will continue to provide excellent shipping opportunities to enterprises in this zone.

69. In addition, project facilities will help generate employment opportunities for the local population, particularly for residents of poor rural communities around Yantai port, and promote economic prosperity in the region. With modern container and bulk terminal operations commencing, more employment opportunities in port-related services are emerging. Providing ADB-financed project facilities in the port was instrumental in establishing the EPZ adjacent to the port. The EPZ further contributed to increased employment opportunities in Yantai and surrounding areas and played an active role in improving people's lives in the region.

70. The water depth at the original container berth was shallow, and the berth could not handle large vessels calling at the port. These vessels, therefore, had to be diverted to other ports. With the Project's implementation, new container berths and multipurpose berths were constructed and the approach channel and turning basin were deepened to -14 meters. Through these efforts, the port's capacity was enhanced considerably, and the port entered a new competitive era.

71. YTPA is now in a better position to compete more effectively with neighboring ports, such as Qingdao and Tianjin. The Project improved the port's position, making it the second

ranked port in the PRC's northern part, and the port is capable of accommodating large ore vessels (up to 160,000 dwt).

72. According to expectations, the Project will continue to contribute to the sustainable and high economic growth of Yantai port's hinterland. For the past 5 years, the average annual disposable income growth rate per capita has been around 5%. And according to local government forecasts, economic development in the coming 5 years will grow annually at a rate of over 10%.

73. Endowed with excellent natural conditions, Yantai port is now regarded as one of the best natural ports in the PRC's northern part. The harbor, which is ice and silt free, now covers a large water area of 867.40 square kilometers and a land area of 4.03 square kilometers with a deepwater basin. Yantai port has an appropriate storage yard facility, amounting to 1.08 million square meters, and warehouse area of 91,000 square meters. The railway line within the port area is connected with the national railway services (Lancun and Dezhou-longkou to Yantai), and this connection significantly enhanced the port's railway transport capacity. The port has expressway access, through the Yantai city ring road, which is connected to the national trunk highway system. Expressway access created an ideal integrated system that will further strengthen the port's operational capacity and meet the future demand for port services.

74. The port exercises good quality control, has modern equipment, and enjoys a good reputation among its customers. The futures of the port, city, and region, which are all growing rapidly, are closely linked. A large proportion of the downtown area immediately adjacent to the port is port land. This area contains the port's homes, school, hospital, and offices, and this land is a major asset with substantial value. The population of Yantai municipality increased from 6.46 million in 2001 to 6.47 million in 2002, while passengers visiting the Project's area for work or leisure increased from 4.0 million in 2001 to 4.2 million in 2002. The overall impact of the Project is considered substantial.

IV. OVERALL ASSESMENT AND RECOMMENDATIONS

A. Overall Assessment

75. Overall, the Project is rated highly successful. The Project achieved its immediate objective of improving provincial and regional socioeconomic development. From the preparatory phase to the completion of construction, the Project obtained extensive guidance and assistance from higher authorities and concerned departments and ADB. YTPA fully prepaid the ADB loan on 19 May 2003, with the help of a local bank, to take advantage of a lower interest rate.

B. Lessons Learned

76. The following lessons were learned during the Project's course:

- (i) ADB involvement to speed up loan effectiveness and monitor project progress is an integral part of ensuring successful operations.
- (ii) Port construction materials should not be procured in one large package or delivered in one bulk shipment. This type of procurement cannot meet the demand for change arising from the alteration or optimization of civil works design and construction schemes. Procurement of this kind also can lead to further expenses, unnecessary storage areas, and possible rust and deterioration

of some equipment that is needed at later stages. Construction materials should be procured under small batch-by-batch procedures, as required, or under a staggered delivery schedule.

C. Recommendations

1. Project-Related

77. The following recommendations were discussed during the course of the project completion review with the Executing Agency and the Government:

- (i) YTPA's concentrating on the core business is essential. However, YTPA should assess all remaining secondary and nonprofit businesses and contract out services that can realize cost savings. Licenses for services and products, such as customs clearance and ships' agencies, could be issued to attract private investors.
- (ii) YTPA's agreeing with the local government on a fair market value for port-allocated land is important, and land values should be reassessed at regular intervals, to enhance YTPA's assets.
- (iii) YTPA's formulating an annual replacement and/or maintenance plan is a key to strengthening the process of port machinery replacement and the adoption of high-standard maintenance systems.
- (iv) YTPA's continuing to monitor the effectiveness of the port's marketing strategy is essential. Relevant frontline managers and staff members should be continuously trained to meet customer service requirements.

2. Executing Agency and the Government

78. Project Completion Review Mission observations and lessons learned throughout project implementation yielded the following recommendations for the Executing Agency and the Government:

- (i) Integrated traffic management plan development is essential to avoiding possible bottlenecks in the port's vicinity.
- (ii) Continuous upkeep and monitoring of the power supply, water supply, fire fighting, and drainage and sewerage systems of various port facilities are essential to meeting emergency requirements.
- (iii) Financial covenants should be designed to encourage better financial performance, but the covenants should be reasonably achievable. The covenanted working ratio level was relatively high for the ADB-financed port project, and YTPA had not achieved this level before appraisal. For future projects, there should be a provision in the Loan Agreement for ADB, the Borrower, and the Executing Agency to reexamine the appropriateness of loan financial covenants during implementation, in cases when the covenanted level is highly unlikely to be achieved because of significant changes in economic conditions or factors having adverse impacts on the covenant.

3. Asian Development Bank

- (i) The port is one of four port projects financed by ADB during the last 14 years in the PRC and is in line with ADB's current policy of encouraging intermodal

transport. The Project represents a unique example of ADB's support for an integrated transport system and efficient transport planning. The Project included various transport modes: port, road, and railway (financed by the Government). Because of the Project's satisfactory results, ADB should consider addressing the intermodal aspects under future port projects. With the transfer of port responsibilities to local governments under the new law, ADB should also consider addressing the problem of urban transport and urbanization issues, including those related to ports that are located near cities.

- (ii) The ports sector faces an increasing level of competition and pressure to improve its efficiency and effectiveness. In general, ADB-financed port projects are managed in cost conscious ways. ADB could have formulated a new sectorwide lending product, in collaboration with the Treasury Department and others, for refinancing the existing pool-based loans, to maintain a large portfolio and prevent project risks from flowing back to domestic banks that prepay loans but still have relatively fragile asset quality.

CHRONOLOGY OF MAJOR EVENTS

| | |
|-------------------|--|
| 13–27 Jan 1995 | Fact-Finding Mission fielded |
| 6 Apr 1995 | Management review meeting |
| 30 Apr 1995 | Circulation of summary environmental impact assessment to the Board of Directors |
| 3–24 May 1995 | Appraisal Mission fielded |
| 22 Sep 1995 | Staff review committee meeting |
| 25–27 Oct 1995 | Loan negotiations |
| 12 Dec 1995 | Approval of a loan and technical assistance valued at \$63.00 million and \$0.49 million, respectively |
| 30 Jan–3 Feb 1996 | Inception Mission fielded |
| 27 Mar 1996 | Approval of prequalification evaluation criteria proposed by the Executing Agency |
| 9 Aug 1996 | Receipt of prequalification evaluation report for dredging and marine works |
| 27 Sep 1996 | Receipt of revised prequalification evaluation report for dredging and marine works |
| Sep 1996 | Approval of feasibility study report for port component |
| 6 Nov 1996 | Approval of prequalification of contractors for international competitive bidding (Package 1 and Package 2) |
| 9–11 Dec 1996 | Review Mission 1 fielded |
| 11 Dec 1996 | Loan Agreement and Project Agreement signing |
| 11 Mar 1997 | Loan declared effective |
| 26–28 Jul 1997 | Review Mission 2 fielded |
| 29 Aug 1997 | Award of contract for dredging and marine works |
| 3–6 Nov 1997 | Review Mission 3 fielded |
| 7 Sep 1998 | Approval of procurement list of communication equipment through direct purchase |
| 17 Sep 1998 | Cancellation of converting the general cargo berth to a container terminal due to the Asian financial crisis and its uncertain impact on traffic development |
| 16–23 Nov 1998 | Review Mission 4 fielded |
| 6–9 Sep 1999 | Review Mission 5 fielded |
| 11 Jan 1999 | Award of contract for telecommunications equipment |
| 4 Mar 1999 | Approved request to increase ADB financing from 76% to 100% on foreign expenditures for Other Equipment category |

| | |
|-------------------|--|
| 14 Nov 1999 | Receipt of the Port Management Reforms Action Plan |
| 24–26 Nov 1999 | Special Loan Administration Mission fielded (Mission 6) to discuss possible measures to improve the Yantai Port Authority's financial performance, follow-up actions related to the authority's failure to comply with the financial requirement under the loan, and current status of the proposed port law |
| 13 Dec 1999 | Award of contract for the procurement of quayside gantry cranes and six rail-mounted gantry cranes |
| 17 Dec 1999 | Award of contract for the procurement of a power cable |
| 13 Jan 2000 | Award of contract for the procurement of a forklift |
| 26 Jan 2000 | Receipt of final report on the feasibility study report on further port dredging |
| 15 Mar 2000 | Award of contract for the procurement of a transformer and switch panel |
| 1 May 2000 | Approved a change in project scope and use of surplus loan proceeds |
| 19 May 2000 | Approved extension of loan closing date by 24 months (from 30 June 2000 to 30 June 2002) |
| 13 Jul 2000 | Approved request for adoption of limited tendering for procurement of additional dredging and gantry crane |
| 14 Aug 2000 | Award of contract for the procurement of a wheel loader, container tractor, semitrailer, container top lifter, harbor tugboat, and container terminal computer |
| 1 Sep 2000 | Award of contract for the procurement of 110-kilovolt line engineering and one 110-kilovolt transformer substation, one 10-kilovolt power substation and cable, and high pole lights |
| 9 Feb 2001 | Award of contract (limited tendering) for the procurement of a quayside gantry crane (subject to renegotiating a reduction in the price quoted, since there was a 21% increase from the last purchase) |
| 24–30 April 2001 | Review Mission 7 fielded |
| 11 Sep 2001 | Cancellation of \$10.00 million loan savings |
| 24 Sep–1 Oct 2002 | Review Mission 8 fielded |
| 28 Nov 2002 | Additional cancellation of loan savings of \$3.40 million |
| 10 Mar 2003 | Cancellation of undisbursed loan balance of \$102,597.20 and closing of loan account |
| 7–10 Oct 2003 | Project Completion Review Mission fielded |

COMPLETION OF WORKS PLANNED

| Item | Brief Description | Completion Date |
|------------------------|--|--------------------------------|
| Dredging | 1. Quantity: 6,443,716.76 cubic meters 2. Cost: 64,164,405.91 CNY (local currency cost was 30,798,914.84 CNY and ADB's loan was valued at 33,365,491.07 CNY) | December 2000 |
| Further Dredging Works | 1. Quantity: 5,200,000 cubic meters 2. Cost: 85,818,054.08 CNY (local currency cost was 41,192,665.95 CNY and ADB's loan was valued at 44,625,388.13CNY) | October 2001 |
| Marine Works | 1. Length of wharf: 961 meters (the length of two container berths is 543 meters, and the length of two general cargo berths is 418 meters) 2. Cost: 144,500,117.00 CNY (local currency cost was 69,360,055.68 CNY, and ADB's loan was valued at 75,140,061.32 CNY) | December 2001 |
| Cofferdam | Length: 1,236 meters | October 2001 |
| Revetment | Length: 2,080 meters | September 2001 |
| Road | Area: 66,100 square meters (inside port) | August 2001 |
| Railway | Length: 4, 945 meters (inside port) | October 2001 |
| Building | Area: 12,452 square meters | October 2001 |
| Training | 60 person-months trained internationally | November 1997– January 2000 |
| Equipment | Provision of cargo and container handling equipment, computerized equipment, and harbor crafts and vehicles | December 2001– January 2002 |
| Auxiliary | Provision of water supply, power supply, storage yard, etc. | October 2001 |

FINANCING PLAN

Table A3.1: Appraisal Versus Actual Financing
(\$ million)

| Source | At Appraisal | | | Actual | | |
|------------------------------------|------------------|----------------|---------------|------------------|----------------|---------------|
| | Foreign Exchange | Local Currency | Total | Foreign Exchange | Local Currency | Total |
| Ministry of Communications | 0.00 | 13.00 | 13.00 | 0.00 | 21.60 | 21.60 |
| State Development Bank (soft loan) | 0.00 | 32.00 | 32.00 | 0.00 | 5.00 | 5.00 |
| State Development Bank (hard loan) | 0.00 | 36.00 | 36.00 | 0.00 | 36.70 | 36.70 |
| Yantai Port Authority | 11.00 | 5.00 | 16.00 | 0.00 | 4.70 | 4.70 |
| Asian Development Bank | 63.00 | 0.00 | 63.00 | 49.50 | 0.00 | 49.50 |
| Total | 74.00 | 86.00 | 160.00 | 49.50 | 68.00 | 117.50 |

\$ = US dollars.

Table A3.2: Financing Plan by Component
(\$ million)

| Item | Appraisal Estimate | | | Actual | | |
|------------------------------------|--------------------|----------------|--------------|------------------|----------------|--------------|
| | Foreign Exchange | Local Currency | Total | Foreign Exchange | Local Currency | Total |
| A. Base Cost | | | | | | |
| – Project Preparation | — | 15.6 | 15.6 | 0.0 | 17.7 | 17.7 |
| – Dredging | 4.2 | 3.9 | 8.1 | 9.4 | 10.1 | 19.5 |
| – Civil works | 16.7 | 44.1 | 60.8 | 9.1 | 34.2 | 43.3 |
| – Cargo Handling | 24.1 | 0.0 | 24.1 | 21.6 | 0.1 | 21.7 |
| Equipment | | | | | | |
| – Other Equipment | 5.1 | 1.6 | 6.7 | 5.2 | 0.0 | 5.2 |
| – Consulting Services and Training | 0.5 | 0.5 | 1.0 | 0.4 | 0.5 | 0.9 |
| Total Base Cost | 50.6 | 65.7 | 116.3 | 45.7 | 62.6 | 108.3 |
| B. Contingencies | 9.6 | 17. | 27.4 | 0.0 | 0.0 | 0.0 |
| C. IDC and other charges | 2.8 | 9.6 | 12.4 | 3.8 | 5.4 | 9.2 |
| D. Taxes | | 3.9 | 3.9 | 0.0 | 0.0 | 0.0 |
| Total Project Cost | 63.0 | 97.0 | 160.0 | 49.5 | 68.0 | 117.5 |

— = no data available, \$ = US dollars, IDC = interest during construction.

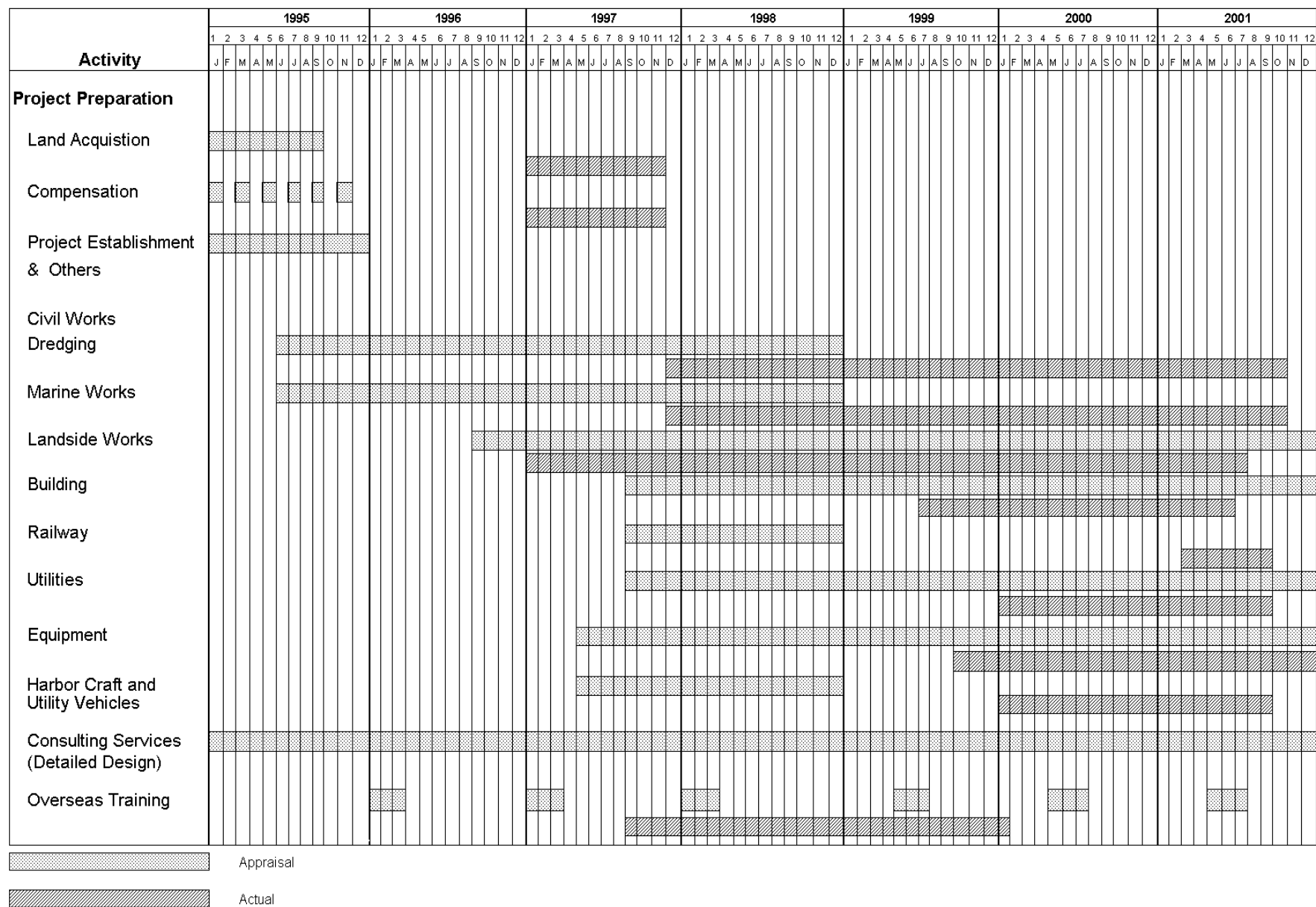
PROCUREMENT DETAILS
Table A4: List of Contract Packages

| Contract No. | Name of Contractor | Item | Mode of Procurement | Contract Date | Country of Origin of the Contractor/ Supplier | Original Contract Amount (CNY) | Contract Amount in \$ Equivalent | Final Payment (\$ equivalent) |
|-----------------------|-----------------------------------|--|---------------------|---------------|---|--------------------------------|----------------------------------|-------------------------------|
| A. Civil Works | | | | | | | | |
| 1 | Tianjin Waterway Bureau | Dredging Works | ICB | 19/09/97 | PRC | 33,365,491.00 | 4,030,299.00 | 4,030,299.00 |
| 2 | Tianjin Navigational Eng. Bureau | Marine Works | ICB | 19/09/97 | PRC | 75,140,061.00 | 9,076,752.00 | 9,076,752.00 |
| 3 | Tianjing Dredging Company | Further Dredging Works | LTD/TDR | 09/03/01 | PRC | 44,625,388.00 | 5,391,531.00 | 5,391,531.00 |
| Subtotal | | | | | | 153,130,940.00 | 18,498,582.00 | 18,498,582.00 |
| B. Equipment | | | | | | | | |
| 1 | Shanghai Port Machinery Plant | Quayside Container crane (50.5 t) | ICB | 30/12/99 | PRC | | 9,840,000.00 | 9,840,000.00 |
| 2 | Shanghai Port Machinery | Mounted Gantry Cranes (40.5 t) | ICB | 30/12/99 | PRC | | 4,002,000.00 | 4,002,000.00 |
| 3 | Kalmar Industries | Forklift (25 t) | ICB | 01/03/00 | SWE | | 213,000.00 | 213,000.00 |
| 4 | Hubei Technical Import/Export | Semi-trailers (35 t) | ICB | 31/08/00 | PRC | | 298,944.00 | 298,944.00 |
| 5 | Kalmar Industries | Container Top Lifter (10 t) | ICB | 01/09/00 | SWE | | 220,000.00 | 220,000.00 |
| 6 | Chuwa Bussan Co. Ltd | Container Terminal Computer System | ICB | 03/09/00 | JPN | | 411,578.00 | 411,578.00 |
| 7 | Lei Shing Hong Machinery | Wheel Loaders (8 t) | ICB | 30/08/00 | PRC | | 1,182,000.00 | 1,182,000.00 |
| 8 | Liaoning MEC Group Co. Ltd | Container Tractor (65 t & 45 t) | ICB | 02/09/00 | PRC | | 1,111,985.00 | 1,111,985.00 |
| 9 | Shanghai Hyster Intl | Container Inner Forklift (5,500kg and 3,000 kg) | IS | 01/09/00 | PRC | | 453,626.85 | 453,626.85 |
| 10 | China Harbor Eng. Co. | Harbour tugboat | ICB | 05/09/00 | PRC | | 2,139,800.00 | 2,139,800.00 |
| 11 | China Harbor Eng. Co. | Power Cable | ICB | 20/04/00 | PRC | | 522,765.50 | 522,765.50 |
| 12 | China National Electric Equipment | Transformer & Swith Panel | ICB | 26/03/00 | PRC | | 1,963,647.00 | 1,963,647.00 |
| 13 | Chuwa Bussan Co. Ltd | 800 MHZ Trunked Radio System | DP | 19/11/98 | JPN | | 575,000.00 | 575,000.00 |
| 14 | Shanghai Port Machinery Plant | Quayside Container crane | ICB | 18/03/01 | PRC | | 3,722,400.00 | 3,722,400.00 |
| 15 | Yantai Hua Dong Electronics | Computer Software(Upgrading) | DP | 17/02/03 | PRC | | 144,730.00 | 144,730.00 |
| Subtotal | | | | | | | 26,801,476.35 | 26,801,476.35 |
| Total | | | | | | | 45,300,058.35 | 45,300,058.35 |

DP = direct purchase, ICB = international competitive bidding, IS = international shopping, JPN = Japan, LTD/TDR = limited tendering, PRC = People's Republic of China, SWE = Sweden.

Source: ADB estimates.

IMPLEMENTATION SCHEDULE



COMPLIANCE WITH LOAN COVENANTS

| Covenants | Reference to Loan Documents | Status of Compliance |
|--|--|-------------------------|
| Implementation Arrangements | | |
| 1. The Borrower shall cause MOC to supervise and coordinate project implementation and ensure that project activities are monitored satisfactorily. | Loan Agreement (LA), Section 5, para. 1 | Complied with |
| Training | | |
| 2. The Borrower shall cause MOC to arrange and coordinate training provided under the Project. MOC shall provide for Asian Development Bank (ADB) review and approval a schedule for the training of personnel from the agencies of the Borrower relevant to the ports sector during project implementation. | LA, Schedule 5, para. 2 Project Agreement (PA), Schedule, para. 9 | Complied with |
| 3. The Borrower shall cause MOC to arrange and coordinate interprovincial workshops during which returning trainees will serve as resource people and trainers to key personnel in other port authorities and bureaus of the Borrower. | LA, Schedule 5, para. 3 | Complied with |
| Environment | | |
| 4. Yantai Port Authority (YTPA) shall ensure that the mitigation measures, environmental monitoring program, and summary environmental impact assessment recommendations are implemented. The environmental monitoring program shall include any social impacts of relocating the aquaculture and shipyard activities. | LA, Schedule 5, para. 4 PA, Schedule, para. 8 | Complied with |
| Reports and Accounts | | |
| 5. YPTA shall provide to ADB an annual report at the end of each year that summarizes and analyzes the quarterly reports and other YTPA performance data on an annual basis. The report | PA, Schedule, para.10 | Complied with |

| Covenants | Reference to Loan Documents | Status of Compliance |
|--|---|-------------------------|
| <p>should contain the following parts: (i) summary data on project progress and port performance, (ii) analysis on any variances from the provision of paragraphs on financial performance that shall set out strategies to address any significant variances, and (iii) details of port-tariff charges and all necessary financial data associated with financial performance.</p> | | |
| <p>6. YTPA shall (i) maintain separate accounts for the Project and for each overall operation; (ii) have such accounts and related financial statements audited annually; and (iii) furnish to ADB, promptly after their preparation but not later than 6 months after the close of each related fiscal year, the certified copies of such audited accounts and financial statements and the report of the auditors, all in the English language.</p> | PA, Section 2.09 | Complied with |
| <p>7. YTPA shall submit to ADB not later than 31 December 1998, or any other date as agreed by ADB, a draft container terminal operations plan (CTOP). After the receipt of ADB's comments on the CTOP, the CTOP shall be finalized and implemented on a timely basis.</p> | PA, Schedule, para. 13 | Being complied with |
| Financial | | |
| <p>8. YTPA shall conduct its financial affairs to meet the financial targets set forth in the Loan Agreement through (i) increased revenue from traffic growth, (ii) tariff level and structure adjustments, (iii) improved operational efficiency, or (iv) improved cost control.</p> | LA, Schedule 5, para. 5 PA, Schedule, para. 3(a) | Complied with |
| <p>9. Except as ADB may otherwise agree, YTPA shall maintain for each of its fiscal years after the fiscal year ending 31 December 1996, a ratio of total working</p> | PA, Schedule, para. 3 (b) | Not yet complied with |

| Covenants | Reference to Loan Documents | Status of Compliance |
|--|-----------------------------------|-------------------------|
| expenses to total operating revenue of not higher than 55%. | | |
| 10. Except as ADB and YTPA shall otherwise agree, YTPA shall earn and maintain an annual return on net fixed assets in operation of not less than 7%, commencing from the fiscal year to be agreed with ADB. | PA, Schedule, para. 4(b) | Not yet complied with |
| 11. Port performance indicators shall be used as the basis for improving management efficiency, cost control, and tariff setting. | PA, Schedule, para. 5 | Complied with |
| 12. YTPA shall monitor port performance indicators on a berth-by-berth basis for traffic throughput and commodity-by-commodity handling rates per labor gang, dwell time of containers in the port area, and revenue and working expenses per ton and employee. | PA, Schedule, para. 6 | Complied with |
| 13. YTPA shall ensure that overall performance of its port conforms to port performance indicators. YTPA shall take all such actions as shall be necessary to meet such targets and shall, within 6 months of the end of each fiscal year, report to the Borrower and ADB on the results of its actions. | PA, Schedule, para. 7 | Being complied with |
| Others | | |
| 14. YTPA shall undertake regular project benefit monitoring and evaluation, to ensure that project facilities are managed efficiently and that project benefits are maximized. To this end, YTPA shall collect and analyze the relevant data after 1 year of starting project operations. | PA, Schedule, para. 12 | Complied with |

TECHNICAL ASSISTANCE COMPLETION REPORT

(Division: ECTC)

| | | | | |
|---|-------------------------------|---|-----------------------------------|---|
| TA No. and Name TA: 2466-PRC: <i>Management and Operational Strategies for Port Authorities</i> | | | Amount Approved: \$490,000 | |
| | | | Revised Amount: | |
| Executing Agency Ministry of Communications | | Source of Funding: Japan Special Fund | | TA Amount Undisbursed \$32,408.14 |
| | | | | TA Amount Used \$457,591.86 |
| Date | | | Completion Date | |
| Approval 12 Dec 1995 | Signing 11 Dec 1996 | Fielding of Consultants 9 Feb 1998 | Original 8 Dec 1999 | Actual 27 Dec 1999 |
| | | | Closing Date | |
| | | | Original Dec 1999 | Actual Aug 2000 |
| <p>Description</p> <p>Economic reforms undertaken in the People's Republic of China (PRC) since 1978 have resulted in the rapid development of the areas surrounding ports. These reforms are generating increased volumes of trade and are necessitating the expansion of port capacities to cope with increased traffic and improve efficiency. To cope with the increasing demand for transport services and remove constraints in the road network, the Government launched in 1991 a 30-year program to build a 35,000-kilometer high-grade national trunk highway system network comprising five north-south expressway corridors and seven east-west expressway corridors. In the ports sector, the Government's policy comprised (i) increasing port capacity, (ii) modernizing port facilities, and (iii) overcoming congestion in port approaches by deepening channels and improving interface connections with the land transportation network.</p> <p>ADB's policy dialogue undertaken with the Government concentrated on the following: (i) developing integrated trade arrangements to facilitate efficient distribution in inland areas, mainly by addressing logistics, such as different modes and electronic data interchange controls at ports; (ii) linking more efficiently ports to their hinterlands and national transportation corridors by selective investment in complementary infrastructure in the highways, rail, and inland waterways sectors; and (iii) supporting the emergence of competition between ports at the overlapping margins of port hinterlands. To facilitate the policy development process and maximize the economic and financial benefits anticipated under the Project, technical assistance was included to formulate management and operations strategies for port authorities.</p> <p>Objectives and Scope</p> <p>The technical assistance objective was to assist the Government in establishing a framework for a management and operations strategy, a container terminal operations plan, a staff training plan, and a national conference on container operations and management strategies. The technical assistance scope included (i) a review of the ports subsector in the PRC, (ii) a review of the Project's scope and feasibility, and (iii) a review of the proposed investments' environmental impacts. A consulting contract was awarded on 19 December 1997. Under the technical assistance, the consultants recruited by ADB assisted in the Container Terminal Operation Plan's preparation and implementation, as part of a time-bound management and operations strategy, and in organizing a national conference that was convened in January 1999 in Beijing.</p> <p>Evaluation of Inputs</p> <p>The Executing Agency was the Ministry of Communications in Beijing, while the Yantai Port Authority (YTPA) was the implementing unit. An international consultant (from the United Kingdom) was engaged to implement the technical assistance.</p> <p>The Executing Agency met all technical assistance requirements. The technical assistance was implemented smoothly, and this benefited the Executing Agency significantly. ADB's performance in completing the technical assistance was satisfactory. During the implementation period, ADB provided significant help and paid attention to the Project. In addition to the staff development program, ADB conducted training and seminars that provided very good opportunities to advance Executing Agency and port authority staff awareness of ADB procedures and policies and removed several obstacles to implementation. The implementation arrangements were appropriate to project needs. The number of ADB's review missions was adequate. These missions had a good impact on the efficient implementation of the technical assistance and greatly helped in the successful development of the Project.</p> <p>Evaluation of Outputs</p> <p>Following the technical assistance, YTPA submitted to ADB in 1999 and implemented the Port Management Reforms Action Plan. The process of listing the ferry passenger terminal as a joint-stock company was started at that time. However, the central Government created a major reform in the ports sector in August 2002, which resulted in the</p> | | | | |

transfer of YTPA from the Ministry of Communications to a local government authority, and this transfer created a need for more requirements. The full progress of the listing of the terminal as a joint-stock company, therefore, will be subject to the completion of all transfer processes and the approval of the local government.

As a result of the technical assistance, project components were fully completed as estimated at appraisal. The technical skills of YTPA personnel were significantly upgraded through technology transfer and training. About 60 person-months of training in project management, contract administration, and port planning and management were carried out internationally. All technical assistance items were fully implemented with the assistance of ADB staff and a consultant team.

Overall Assessment and Rating

The technical assistance was successfully carried out with the full cooperation of the ports of Yantai, Xiamen, and Fangcheng. The overall performance of the consultants was excellent, and they maintained close coordination with the Executing Agency and efficiently produced management and operations strategies for port authorities, under the Container Terminal Operations Plan, that were implemented by the Executing Agency in 1999, under the guidance of the consultants and ADB staff.

Major Lessons Learned

The following lessons were learned in the course of the technical assistance: (i) ADB involvement to speed up reform and improve capacity building is an integral part of ensuring successful operations and strategy in the transport sector in the PRC, and (ii) the Project is one of three port projects financed by ADB during the last 14 years in the PRC and is in line with ADB's current policy of encouraging intermodal transport. ADB therefore should consider addressing intermodal aspects under future projects.

Recommendations and Follow-Up Actions

A new law to reform the PRC's port sector was identified under ADB's technical assistance as an essential requirement, and this law was incorporated as a covenant in three port projects (Yantai, Xiamen, and Fangcheng) that were approved in the 1990s. As a result, the PRC's top legislature, the Standing Committee of the National People's Congress, passed a law on port administration in June 2003 to upgrade the construction, management, and competitiveness of the country's sea and river ports. To be in effect on 1 January 2004, the law sets out new legal competencies of local governments with jurisdiction over ports and companies running ports. The central Government will merely play the role of supervisor and coordinator, and companies will run ports in accordance with market principles in a transparent and unbiased manner.

All PRC ports will undergo related administrative restructuring before the end of 2003. ADB investment in the sector during the 1980s and 1990s was about \$300 million, to strengthen the capacity of six ports. Currently, PRC ports handle 9% of domestic cargo transport and 85% of foreign trade cargo. Given the rapid growth of the PRC's foreign trade, ports are expected to see an annual increase of 10% in freight volume, rising from the current 1.6 billion tons to 2 billion tons in 2005. Given this rapid growth trend, the new law will help tighten government supervision and improve port administration and operations. YTPA will benefit significantly from the new law, as all transfer processes and adjustments to the new reform should be accelerated to avoid any productive interposition. With the transfer to local governments, under the new law, of ports that are mostly located in the hearts of cities, ADB should also consider future investment to tackle problems concerning urban transport and urbanization, including better port development.

Prepared by: Kim Jraiw

Designation: Transport Specialist

SOCIOECONOMIC DEVELOPMENT

A. Regional Socioeconomic Development

1. Yantai Port is the major commercial port in the northern part of Shandong Province. Yantai Municipality has kept a rapid socioeconomic development in the last 10 years and became the third largest municipality in Shandong Province (after Jinan and Qingdao) in terms of GDP scales. The GDP growth rates were much higher than the national and provincial levels. Yantai Municipality also became the second one in the scale of imports and exports (after Qingdao) among all municipalities in Shandong Province. This rapid regional development required and inspired the fast development of Yantai Port. The following two tables are the basic socioeconomic development profiles of Yantai Municipality and Shandong Province.

Table A8.1: Yantai Municipality Socioeconomic Development

| Item | Unit | 1995 | 2000 | 2001 | 2002 |
|------------------|------------------|---------|----------|----------|----------|
| GDP | billion yuan | 57.6 | 88.0 | 98.0 | 111.5 |
| GDP Growth Rate | % | 15.5 | 10.6 | 11.0 | 14.1 |
| Population | million persons | 6.4 | 6.5 | 6.5 | 6.5 |
| GDP per capita | yuan / person | 9,020.0 | 13,546.0 | 15,060.0 | 17,131.0 |
| Fiscal Revenue | billion yuan | 2.6 | 3.8 | 4.7 | 4.5 |
| Rural Net Income | yuan / person | 2,261.0 | 3,454.0 | 3,635.0 | 3,826.0 |
| Price Escalation | % over last year | 111.5 | 101.3 | 101.0 | 100.4 |

Source: Yantai Port Authority.

Table A8.2: Shandong Province Socioeconomic Development

| Item | Unit | 1995 | 2000 | 2001 | 2002 |
|------------------|------------------|---------|---------|----------|----------|
| GDP | billion yuan | 500.2 | 854.2 | 943.8 | 1,055.0 |
| GDP Growth Rate | % | 14.1 | 10.5 | 10.1 | 11.6 |
| Population | million persons | 87.1 | 90.0 | 90.4 | 90.9 |
| GDP per capita | yuan / person | 5,758.0 | 9,555.0 | 10,465.0 | 11,643.0 |
| Fiscal Revenue | billion yuan | 17.9 | 46.4 | 57.3 | 61.0 |
| Rural Net Income | yuan / person | 1,715.0 | 2,659.0 | 2,805.0 | 2,954.0 |
| Price Escalation | % over last year | 114.2 | 100.2 | 101.8 | 99.3 |

Source: Yantai Port Authority.

B. Project Hinterland Development

2. The primary hinterland of Yantai Port is the northern part of Shandong Province, mainly Yantai Municipality (composed of 9 cities), which is one of the fast growth coastal areas in China. The broader project hinterlands include Hebei, Henan, Shaanxi, and Shanxi provinces. Like other places, these areas also experienced and are experiencing a high-speed socioeconomic development period.

Table A8.3: Socioeconomic Development in Broader Hinterlands

| Item | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| GDP (billion yuan) | | | | | | |
| Hebei | 395.4 | 425.6 | 456.9 | 508.9 | 557.8 | 607.7 |
| Henan | 407.9 | 435.7 | 457.6 | 513.8 | 564.0 | 616.3 |
| Shaanxi | 130.0 | 138.2 | 148.8 | 166.1 | 184.4 | 203.6 |
| Shandong | 665.0 | 716.2 | 766.2 | 854.2 | 943.8 | 1,055.0 |
| Shanxi | 148.0 | 148.6 | 150.7 | 164.4 | 178.0 | 200.2 |
| GDP Growth Rate (%) | | | | | | |
| Hebei | | 10.7 | 9.1 | 9.5 | 8.7 | 8.9 |
| Henan | | 8.7 | 8.0 | 9.4 | 9.1 | |
| Shaanxi | | 9.1 | 8.4 | 9.0 | 9.1 | |
| Shandong | | 10.8 | 10.1 | 10.5 | 10.1 | 11.6 |
| Shanxi | | 9.0 | 5.1 | 7.8 | 8.4 | |
| Population (million people) | | | | | | |
| Hebei | 65.25 | 65.69 | 66.14 | 66.74 | 66.99 | 67.35 |
| Henan | 92.43 | 93.15 | 93.87 | 94.88 | 95.55 | 96.13 |
| Shaanxi | 35.70 | 35.96 | 36.18 | 36.44 | 36.59 | 36.74 |
| Shandong | 87.85 | 88.38 | 88.83 | 89.98 | 90.41 | 90.82 |
| Shanxi | 31.41 | 31.72 | 32.04 | 32.48 | 32.72 | 32.94 |
| Fiscal Revenue (billion yuan) | | | | | | |
| Hebei | 17.6 | 20.7 | 22.3 | 24.9 | 28.4 | 30.2 |
| Henan | 18.6 | 20.8 | 22.3 | 24.7 | 26.8 | 29.7 |
| Shaanxi | 7.7 | 9.3 | 10.6 | 11.5 | 13.6 | 15.0 |
| Shandong | 29.0 | 35.2 | 40.5 | 46.4 | 57.3 | 61.0 |
| Shanxi | 9.3 | 10.4 | 10.9 | 11.5 | 13.3 | 15.1 |
| Rural Net Income (yuan/person) | | | | | | |
| Hebei | 2,286 | 2,405 | 2,442 | 2,479 | 2,604 | 2,685 |
| Henan | 1,734 | 1,864 | 1,948 | 1,986 | 2,098 | 2,216 |
| Shaanxi | 1,273 | 1,406 | 1,456 | 1,444 | 1,491 | 1,596 |
| Shandong | 2,292 | 2,453 | 2,550 | 2,659 | 2,805 | 2,948 |
| Shanxi | 1,738 | 1,859 | 1,773 | 1,906 | 1,956 | 2,150 |
| National Average | 2,090 | 2,162 | 2,210 | 2,253 | 2,366 | 2,476 |

Source: China Statistical Abstract (2003).

PORT SECTOR DEVELOPMENT

1. Coastal Ports in the PRC have witnessed an increasing development in the last 10 years, in terms of capacity, throughput and services, which was much higher than the economic growth. Table A9.1 contains the statistical data of cargo throughput at main coastal ports of the PRC and Table A9.2 shows the increasing rates. The container berth and container transport has witnessed a very fast in recent years. In 2001, container throughput at all ports of the PRC achieved 27.48 million TEU (254.25 million ton).

Table A9.1: Cargo Throughput at Main Coastal Ports (million ton)

| Port | 1990 | 1995 | 1999 | 2000 | 2001 | 2002 |
|--------------|--------|--------|----------|----------|----------|----------|
| Total | 483.21 | 801.66 | 1,051.62 | 1,256.03 | 1,426.33 | 1,666.28 |
| Basuo | 4.31 | 2.75 | 3.80 | 3.78 | 3.42 | 3.43 |
| Dalian | 49.52 | 64.17 | 85.05 | 90.84 | 100.47 | 108.51 |
| Fuzhou | 5.61 | 10.32 | 14.81 | 24.26 | 29.61 | 39.07 |
| Guangzhou | 41.63 | 72.99 | 101.57 | 111.28 | 128.23 | 153.24 |
| Haikou | 2.88 | 4.68 | 6.74 | 8.08 | 8.88 | 10.73 |
| Lianyungang | 11.37 | 17.16 | 20.17 | 27.08 | 30.58 | 33.16 |
| Ningbo | 25.54 | 68.53 | 96.60 | 115.47 | 128.52 | 153.98 |
| Qingdao | 30.34 | 51.03 | 72.57 | 86.36 | 103.98 | 122.13 |
| Qinghuangdao | 69.45 | 83.82 | 82.61 | 97.43 | 113.02 | 111.67 |
| Rizhao | 9.25 | 14.52 | 20.03 | 26.74 | 29.33 | 31.36 |
| Sanya | 0.37 | 0.42 | 0.27 | 0.48 | 0.71 | 0.49 |
| Shanghai | 139.59 | 165.67 | 186.41 | 204.40 | 220.99 | 263.84 |
| Shenzhen | | 30.80 | 46.63 | 56.97 | 66.43 | 87.67 |
| Tianjin | 20.63 | 57.87 | 72.98 | 95.66 | 113.69 | 129.06 |
| Xiamen | 5.29 | 13.14 | 17.73 | 19.65 | 20.99 | 27.35 |
| Yantai | 6.68 | 13.61 | 16.46 | 17.74 | 21.90 | 26.89 |
| Yingkou | 2.37 | 11.56 | 19.45 | 22.68 | 25.20 | 31.27 |
| Zhanjiang | 15.57 | 18.85 | 17.51 | 20.38 | 22.05 | 26.27 |
| Others | 42.81 | 99.77 | 170.23 | 226.75 | 258.33 | 306.16 |

Note: Highlighted ports are in Shandong Province

Source: China Statistical Abstract (2003).

Table A9.2: Cargo Throughput Increasing Rate

| Port | 1990–1995 | 1996–1999 | 2000 | 2001 | 2002 |
|--------------|------------------|------------------|-------------|-------------|-------------|
| Total | 11% | 7% | 19% | 14% | 17% |
| Basuo | (9%) | 8% | (1%) | (10%) | 0% |
| Dalian | 5% | 7% | 7% | 11% | 8% |
| Fuzhou | 13% | 9% | 64% | 22% | 32% |
| Guangzhou | 12% | 9% | 10% | 15% | 20% |
| Haikou | 10% | 10% | 20% | 10% | 21% |
| Lianyungang | 9% | 4% | 34% | 13% | 8% |
| Ningbo | 22% | 9% | 20% | 11% | 20% |
| Qingdao | 11% | 9% | 19% | 20% | 17% |
| Qinghuangdao | 4% | 0% | 18% | 16% | (1%) |
| Rizhao | 9% | 8% | 33% | 10% | 7% |
| Sanya | 3% | (10%) | 76% | 48% | (31%) |
| Shanghai | 3% | 3% | 10% | 8% | 19% |
| Shenzhen | | 11% | 22% | 17% | 32% |
| Tianjin | 23% | 6% | 31% | 19% | 14% |
| Xiamen | 20% | 8% | 11% | 7% | 30% |
| Yantai | 15% | 5% | 8% | 23% | 23% |
| Yingkou | 37% | 14% | 17% | 11% | 24% |
| Zhanjiang | 4% | (2%) | 16% | 8% | 19% |
| Others | 18% | 14% | 33% | 14% | 19% |

Source: China Statistical Abstract (2003).

YANTAI PORT DEVELOPMENT

1. In the last 10 years, Yantai Port has witnessed a significant growth. From 1995 to 2002, both of the port's cargo capacity and throughput were doubled. The ADB-financed project was one of the first key port improvement projects in the PRC during the 1990's. At Yantai Project, two dedicated container berths and two conventional cargo berths for large vessels were built, which ended the history of no container berth and enabled the port to receive large cargo vessels in winter. The technology level of the container berths kept ahead of all coastal ports in the PRC.

2. In 2002, the total container loading and unloading at the Project berths achieved 99,000 TEU, which was about 62% of the total container throughput (160,000 TEU) at whole Yantai Port. Along with the maturing of the container berths, the throughput will be increased rapidly and will reach its capacity by 2004. In 2002, the Project conventional cargo berths were mainly used for large vessels of iron ore. The handling efficiency was much higher than that of port average. Its capacity is expected to be reached by 2005.

Table A10.1: Capacity and Throughput at Yantai Port

| Item | Unit | 1995 | 2000 | 2001 | 2002 |
|-----------------|----------------------|-------|-------|-------|-------|
| No of Berth | No. | 26 | 31 | 35 | 35 |
| 10k Ton Berth | No. | 9 | 15 | 19 | 19 |
| Container Berth | No. | — | — | 2 | 2 |
| Capacity | | | | | |
| Cargo | million ton | 7.11 | 11.46 | 14.01 | 14.01 |
| Container | '000 TEU | — | — | 240 | 240 |
| Passenger | '000 person times | 950 | 950 | 950 | 950 |
| Throughput | | | | | |
| Cargo | million ton | 13.61 | 17.74 | 21.90 | 26.89 |
| Foreign Trade | million ton | 7.23 | 8.06 | 11.05 | 13.53 |
| Container | '000 TEU | 60 | 130 | 120 | 160 |
| Passenger | million person times | 3.16 | 3.98 | 4.01 | 4.20 |

k = kilo, TEU = twenty-foot equivalent unit.

Source: Yantai Port Authority.

Table A10.2: Increasing Rate of Capacity and Throughput at Yantai Port

| Item | Unit | 1995–2000 | 2001 | 2002 |
|-----------------|------|-----------|--------|-------|
| No of Berth | % | 3.6% | 12.9% | 0.0% |
| 10k ton berth | % | 10.8% | 26.7% | 0.0% |
| Container berth | No. | | 100% | 0.0% |
| Capacity | | | | |
| Cargo | % | 10.0% | 22.3% | 0.0% |
| Container | % | | | 0.0% |
| Passenger | % | 0.0% | 0.0% | 0.0% |
| Throughput | | | | |
| Cargo | % | 5.4% | 23.4% | 22.8% |
| Foreign Trade | % | 2.2% | 37.1% | 22.4% |
| Container | % | 16.7% | (7.7%) | 33.3% |
| Passenger | % | 4.7% | 0.8% | 4.7% |

Source: Yantai Port Authority.

3. The following is the cargo throughput by commodities at whole Yantai Port in 2002.

Table A10.3: Throughput by Commodities (2002)
(k ton)

| Cargo | Total | Export | | | Import | | |
|------------------------|-----------|----------|----------|----------|----------|----------|----------|
| | | | Foreign | Domestic | | Foreign | Domestic |
| Total | 26,894.1 | 10,099.1 | 2,827.3 | 7,271.9 | 16,795.0 | 10,700.6 | 6,094.4 |
| Coal | 873.8 | 519.1 | 508.8 | 10.3 | 354.8 | 72.3 | 282.5 |
| Oil | 354.6 | 17.3 | 0.0 | 17.3 | 337.3 | 150.5 | 186.8 |
| Iron Ore | 7,366.2 | 762.2 | 0.0 | 762.2 | 6,604.0 | 6,433.6 | 170.4 |
| Steel | 1,130.8 | 441.2 | 137.1 | 304.0 | 689.7 | 346.5 | 343.2 |
| Construction Materials | 463.5 | 461.5 | 390.8 | 70.6 | 2.0 | 0.0 | 2.0 |
| Cement | 843.9 | 843.9 | 810.1 | 33.8 | 0.0 | 0.0 | 0.0 |
| Timber | 236.0 | 0.0 | 0.0 | 0.0 | 236.0 | 188.1 | 47.9 |
| Non-ferrous Ore | 50.3 | 36.5 | 30.1 | 6.3 | 13.8 | 10.4 | 3.4 |
| Fertilizer | 1,928.2 | 92.9 | 72.9 | 20.0 | 1,835.3 | 1,803.4 | 31.9 |
| Salt | 94.0 | 35.0 | 0.0 | 35.0 | 59.0 | 0.0 | 59.0 |
| Grain | 1,215.3 | 88.7 | 0.0 | 88.7 | 1,126.5 | 1,079.2 | 47.3 |
| Others | 12,337.4 | 6,800.9 | 877.4 | 5,923.5 | 5,536.6 | 616.5 | 4,920.0 |
| Of Container | 1,468.0 | 939.5 | 697.6 | 241.9 | 528.5 | 418.4 | 110.0 |
| which # of TEU | 160,126.0 | 79,508.0 | 65,172.0 | 14,336.0 | 80,618.0 | 65,388.0 | 15,230.0 |

TEU = twenty-foot equivalent unit.

Source: Yantai Port Authority.

4. **Throughput at Project Berths.** According to the statistics of Yantai Port, the throughput in 2002 at the Project berths were 99,000 TEU (645 vessels) at the dedicated container berths and 4.76 million ton conventional cargo (81 vessels, mainly iron ore) at the conventional cargo berths. The average loading and unloading weights were about 1,407 ton per container vessel (153 TEU per vessel and 9.17 ton per TEU) and 58,800 ton per conventional cargo vessel at the Project berths. These throughputs were higher than that estimated at appraisal.

5. It was also predicted that at the Project berths the container throughput would be increasing rapidly in the earlier years of opening. These throughputs would reach the designed capacity (240,000 TEU / 1.8 million ton) by 2004 and the conventional cargo would reach the designed capacity at 2005. In fact, the throughput at the conventional cargo berths was much higher than the designed capacity, even at the first year operation, due to that these two Project berths were mainly used for iron ore vessels. It was forecasted that in the period of 2005 to 2010, the container throughput would be increased by 3% each year and then keeps that throughput for the rest of calculation years. The conventional cargo throughput would keep at 7 million ton after 2005.

Table A10.4: Traffic Forecast at Project Berths

| Year | Container Berths | | | Bulk Cargo Berths | | Increasing Rates | |
|------|------------------|---------|-------------|-------------------|-------------|------------------|------------|
| | '000TEU | Vessels | million ton | Vessels | million ton | Container | Bulk Cargo |
| 2002 | 99 | 645 | 0.91 | 81 | 4.76 | | |
| 2003 | 190 | 1238 | 1.74 | 102 | 6.00 | 92% | 26% |
| 2004 | 250 | 1629 | 2.29 | 111 | 6.50 | 32% | 8% |
| 2005 | 260 | 1678 | 2.36 | 119 | 7.00 | 3% | 8% |
| 2006 | 270 | 1728 | 2.43 | 119 | 7.00 | 3% | |
| 2007 | 270 | 1780 | 2.51 | 119 | 7.00 | 3% | |
| 2008 | 280 | 1833 | 2.58 | 119 | 7.00 | 3% | |
| 2009 | 290 | 1888 | 2.66 | 119 | 7.00 | 3% | |
| 2010 | 300 | 1945 | 2.74 | 119 | 7.00 | 3% | |
| 2011 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2012 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2013 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2014 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2015 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2016 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2017 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2018 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2019 | 300 | 1945 | 2.74 | 119 | 7.00 | | |
| 2020 | 300 | 1945 | 2.74 | 119 | 7.00 | | |

TEU = twenty-foot equivalent unit.

Source: Yantai Port Authority.

6. The total cargo throughput at whole Yantai Port was 26.89 million ton in 2002. The EA estimated that the throughput would still keep increasing by 20% - 30% each year before 2010 without serious investment. Based on this, a conservative forecast for the throughput of whole Yantai Port was made, in which it was assumed that the throughput increasing rates were 20% and 10% in the period of before 2005 and 2006-2010. Then, the throughput would keep the 2010 level for the rest years, assuming no significant capacity increasing. Comparing with that of entire port, the share of throughput at the Project berths would take about 20% in earlier years, and then declining due to the constraints of hard capacities at the Project berths.

Table A10.5: Traffic Forecast for Yantai Port and Share of Project Berths

| Year | All Berth Million Ton | Share of Project Berth | | |
|-------------|----------------------------------|-------------------------------|------------------|-------------|
| | | Total | Container | Bulk |
| 2002 | 26.89 | 21% | 3% | 18% |
| 2003 | 32.27 | 24% | 5% | 19% |
| 2004 | 38.72 | 23% | 6% | 17% |
| 2005 | 46.47 | 20% | 5% | 15% |
| 2006 | 51.11 | 18% | 5% | 14% |
| 2007 | 56.22 | 17% | 4% | 12% |
| 2008 | 61.85 | 15% | 4% | 11% |
| 2009 | 68.03 | 14% | 4% | 10% |
| 2010 | 74.83 | 13% | 4% | 9% |
| 2011 | 74.83 | 13% | 4% | 9% |
| 2012 | 74.83 | 13% | 4% | 9% |
| 2013 | 74.83 | 13% | 4% | 9% |
| 2014 | 74.83 | 13% | 4% | 9% |
| 2015 | 74.83 | 13% | 4% | 9% |
| 2016 | 74.83 | 13% | 4% | 9% |
| 2017 | 74.83 | 13% | 4% | 9% |
| 2018 | 74.83 | 13% | 4% | 9% |
| 2019 | 74.83 | 13% | 4% | 9% |
| 2020 | 74.83 | 13% | 4% | 9% |

FINANCIAL PERFORMANCE

1. Financial performance comprises key operation statistics and the financial statements of the Yantai Port Authority (YTPA). YTPA's financial statements (income statement, balance sheet, and cash flow statement) are shown in Table A11 in comparison with the appraisal forecast from 1995 to 2002. Based on the assumptions drawn from actual performance, the forecasts for 2 years (2003 and 2004) are prepared in current prices projecting the trend of YTPA's businesses.

2. Although foreign cargo handling volume was adversely affected by the Asian financial crisis in 1998 and 1999, traffic at Yantai port increased in a steady manner and, in general, moved slightly lower than the appraisal estimate until 2001. In 2001 and 2002, actual traffic exceeded appraisal estimates. Container traffic is a driving force behind improved performance. As found in major ports in the People's Republic of China (PRC), the general trend shows that a large proportion of foreign and domestic cargo tends to be containerized. The growth of container traffic was remarkable. Since 1999, actual container volume has been 1.5–2.0 times the appraisal forecast. The two project container berths opened for traffic in 2002 relieved congestion and facilitated more efficient operations. Between 2001 and 2002, container throughputs at Yantai port increased by 33%.

3. Tariffs, however, tend to decrease, due to fierce competition in PRC ports. Financial performance was significantly lower than the appraisal forecast mainly because of lower tariffs. The appraisal assumptions were made during the inflationary period in the early 1990s. The port tariff was increased by 50% for foreign ships and 30% for domestic ships in 1996. On a unit revenue basis, foreign ship call revenue increased in real terms by 42% between 1996 and 2002. In real terms, for the same period, average domestic ship call revenue increased by only 5%, and foreign cargo handling revenue decreased by 40%, domestic cargo handling revenue decreased by 32%, and container handling revenue decreased by 15%. This trend indicates a need for ports to improve management and for an acceleration of the survival and reform processes.

4. Real increase of expenses, such as salaries and wages and energy costs, are significantly lowering financial performance indicators. YTPA's profitability has been weakened since 1998. Two financial indicators were covenanted at appraisal: (i) a working ratio of not less than 55.0% and (ii) a return on net assets in operation of not less than 7.0%. The average annual working ratio during the implementation period was 69.7%, against the 55.0% covenanted. A breach occurred from the year following loan approval. During implementation, ADB, the Government, and YTPA had several occasions to discuss this covenant, and measures were taken to improve operation and management. Also, YTPA's return on net assets started declining after loan approval and did not reach the covenanted level during implementation. A sign of recovery was finally shown toward the end of implementation. The average return on net assets was 2.8%, against the covenanted 7.0%. YTPA actively made investments from 1996 to 2001 for port capacity expansion. The number of berths increased from 35 in 1995 to 56 in 2002. As the results of port investments do not appear immediately, the level of this covenant set at appraisal is likely to be on high side.

5. Together with capacity expansion, YTPA formulated its detailed Port Management Reforms Action Plan in 1999, with specific targets, and carried the plan out from 2000. The action plan envisaged (i) passenger company recapitalization, through initial public offering; (ii) debt-equity swap; (iii) logistics network enhancement in the hinterland; (iv) social assets separation; (v) equipment use and/or machinery lease and maintenance outsourcing;

(vi) rationalization; and (vii) business development and/or marketing strengthening. These actions are still ongoing, and their effects are expected to arise in the near future.

6. One of the concerns regarding YTPA's financial performance was the relatively high debt proportion in its assets compared with the other port authorities in ADB's PRC ports sector. Therefore, YTPA's management was conscious of financial costs. In 2000, interest expenses reached nearly 10% of total revenues, and the financial burden started undermining YTPA's soundness and profitability. As ADB's pool-based loan was considered costlier than other borrowings that YTPA could otherwise apply, the outstanding loan amount was fully prepaid in May 2003.

Table A11: Actual Financial Performance and Appraisal Financial Projections of Yantai Port Authority
(CNY '000)

| Item | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | |
|---------------------------------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|-----------------|------------------|----------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual |
| Operational Statistics: | | | | | | | | | | |
| Domestic Inflation Rate | 15% | 17.1% | 10% | 8.3% | 7% | 2.8% | 7% | -0.8% | 7% | -1.4% |
| Foreign Throughput ('000 tons) | 5,659 | 6,795 | 5,804 | 6,902 | 7,314 | 8,055 | 7,561 | 6,419 | 8,441 | 6,234 |
| Domestic Throughput ('000 tons) | 7,510 | 6,364 | 7,703 | 6,592 | 9,708 | 7,540 | 10,034 | 8,688 | 11,204 | 10,230 |
| of which Container ('000 TEUs) | 48 | 70 | 48 | 93 | 86 | 100 | 86 | 100 | 175 | 112 |
| Foreign Ship Calls | 684 | 820 | 698 | 983 | 844 | 874 | 866 | 746 | 947 | 885 |
| Domestic Ship Calls | 572 | 302 | 584 | 225 | 705 | 276 | 724 | 352 | 792 | 415 |
| Average Foreign Cargo Tariff/Ton | 40.6 | 29.6 | 51.1 | 26.7 | 54.7 | 25.5 | 54.7 | 24.0 | 62.3 | 22.0 |
| Average Domestic Cargo Tariff/Ton | 13.5 | 5.6 | 16.0 | 5.5 | 17.1 | 4.2 | 17.1 | 4.5 | 19.5 | 4.4 |
| Average Container Cargo Tariff/TEU | 527.7 | 423.1 | 664.9 | 297.2 | 711.5 | 297.0 | 711.5 | 274.0 | 811.1 | 300.0 |
| Average Foreign Ship Revenue ('000) | 27.0 | 25.7 | 34.0 | 24.7 | 36.3 | 38.9 | 36.3 | 30.4 | 41.4 | 31.0 |
| Average Domestic Ship Revenue ('000) | 7.3 | 6.5 | 8.6 | 5.2 | 9.2 | 8.4 | 9.2 | 5.7 | 10.5 | 5.8 |
| Number of Employees | 8,021 | 8,083 | 8,026 | 8,153 | 9,031 | 8,183 | 9,108 | 8,150 | 9,253 | 8,042 |
| Throughput/Employees ('000) Tons | 1,642 | 1,690 | 1,683 | 1,737 | 1,885 | 1,994 | 1,932 | 1,942 | 2,123 | 2,148 |
| Revenue | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual |
| Cargo Handling Charges | 341,365 | 274,672 | 433,238 | 237,585 | 591,789 | 255,484 | 610,843 | 220,400 | 770,659 | 215,600 |
| Foreign | 214,802 | 213,733 | 278,072 | 194,694 | 364,628 | 202,484 | 378,096 | 154,300 | 420,687 | 137,000 |
| Domestic | 101,057 | 35,553 | 123,029 | 16,141 | 165,897 | 23,300 | 171,483 | 38,700 | 208,361 | 45,000 |
| Container | 25,506 | 25,386 | 32,137 | 26,750 | 61,264 | 29,700 | 61,264 | 27,400 | 141,611 | 33,600 |
| Ship Charges | 22,604 | 23,017 | 28,756 | 25,482 | 37,174 | 36,360 | 38,176 | 24,700 | 47,577 | 29,800 |
| Foreign | 18,446 | 21,054 | 23,719 | 24,310 | 30,663 | 34,042 | 31,489 | 22,700 | 39,244 | 27,400 |
| Domestic | 4,158 | 1,963 | 5,037 | 1,172 | 6,511 | 2,318 | 6,687 | 2,000 | 8,333 | 2,400 |
| Other Services | 41,812 | 111,089 | 53,192 | 160,474 | 68,764 | 137,446 | 70,617 | 107,225 | 88,006 | 144,900 |
| Less: Business Tax | 13,269 | 14,022 | 16,847 | 14,245 | 22,816 | 14,311 | 23,532 | 12,191 | 29,634 | 12,763 |
| Net Operating Revenue | 392,512 | 394,756 | 498,339 | 409,296 | 674,911 | 414,979 | 696,104 | 340,134 | 876,608 | 377,537 |
| Working Expenses | 237,999 | 267,957 | 270,731 | 283,148 | 346,069 | 292,452 | 366,738 | 234,487 | 420,641 | 233,100 |
| Personnel | 40,940 | 49,216 | 46,241 | 55,238 | 56,544 | 58,627 | 61,084 | 53,500 | 66,475 | 50,000 |
| Fuel & Materials | 72,999 | 74,598 | 84,512 | 86,234 | 115,743 | 81,443 | 128,162 | 59,000 | 153,286 | 48,000 |
| Maintenance | 12,187 | 14,738 | 14,039 | 19,843 | 18,432 | 16,412 | 20,277 | 20,300 | 23,746 | 17,000 |
| Administration | 66,986 | 73,314 | 74,232 | 80,161 | 87,460 | 96,449 | 82,530 | 85,799 | 89,673 | 79,127 |
| Others | 44,887 | 56,091 | 51,707 | 41,672 | 67,890 | 39,521 | 74,685 | 15,888 | 87,461 | 38,973 |
| Depreciation Expenses | 74,360 | 56,489 | 96,326 | 62,941 | 123,799 | 64,126 | 153,068 | 105,100 | 192,053 | 105,100 |
| Total Operating Expenses | 312,359 | 324,446 | 367,057 | 346,089 | 469,868 | 356,578 | 519,806 | 339,587 | 612,694 | 338,200 |
| Operating Profit (Loss) | 80,153 | 70,310 | 131,282 | 63,207 | 205,043 | 58,401 | 176,298 | 547 | 263,914 | 39,337 |
| Nonoperating Income | 7,091 | 2,552 | 7,840 | 2,184 | 8,826 | 2,486 | 9,507 | 458 | 10,410 | 1,600 |
| Nonoperating Expenses | 6,523 | 7,151 | 7,212 | 4,749 | 8,119 | 5,534 | 8,746 | 8,176 | 9,576 | 2,200 |
| Interest Expenses | 16,575 | 19,211 | 16,809 | 15,639 | 42,573 | 27,790 | 40,877 | 28,904 | 39,055 | 37,600 |
| Net Profit (Loss) Before Tax | 64,146 | 46,500 | 115,101 | 45,003 | 163,177 | 27,563 | 136,182 | (36,075) | 225,693 | 1,137 |
| Income Tax Payable | 21,168 | 13,122 | 37,984 | 14,269 | 53,848 | 8,649 | 44,940 | 996 | 74,475 | 900 |
| Net Profit (Loss) for the Year | 42,978 | 33,378 | 77,117 | 30,734 | 109,329 | 18,914 | 91,242 | (37,071) | 151,218 | 237 |
| Performance Indicators | | | | | | | | | | |
| Working Ratio (covenanted at <=55%) | 61% | 68% | 54% | 69% | 51% | 70% | 53% | 69% | 48% | 62% |
| Operating Ratio | 80% | 82% | 74% | 85% | 70% | 86% | 75% | 100% | 70% | 90% |

TEU = twenty-foot equivalent unit.
Source: Yantai Port Authority and ADB staff estimates.

continued on next page

Table A11 – Continued
(CNY '000)

| Item | 2000 | | 2001 | | 2002 | | 2003 | 2004 | 2005 | 2006 |
|---------------------------------------|------------------|-----------------|------------------|----------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Tentative | Forecast | Forecast | Forecast | Forecast |
| Operational Statistics: | | | | | | | | | | |
| Domestic Inflation Rate | 7% | -0.5% | 7% | 0.7% | 7% | 1.0% | 2% | 2% | 2% | 2% |
| Foreign Throughput ('000 tons) | 8,938 | 8,058 | 9,058 | 11,052 | 9,185 | 13,528 | 15,769 | 17,130 | 17,644 | 18,173 |
| Domestic Throughput ('000 tons) | 11,862 | 9,678 | 12,022 | 10,850 | 12,190 | 13,366 | 14,237 | 18,870 | 19,153 | 13,422 |
| of which Container ('000 TEUs) | 220 | 130 | 242 | 120 | 267 | 160 | 230 | 300 | 330 | 363 |
| Foreign Ship Calls | 992 | 906 | 1,002 | 942 | 1,014 | 1,300 | 1,515 | 1,646 | 1,679 | 1,712 |
| Domestic Ship Calls | 829 | 591 | 838 | 606 | 847 | 583 | 620 | 821 | 829 | 838 |
| Average Foreign Cargo Tariff/Ton | 62.3 | 19.8 | 71.1 | 20.7 | 71.1 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 |
| Average Domestic Cargo Tariff/Ton | 19.5 | 4.3 | 22.2 | 4.5 | 22.2 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| Average Container Cargo Tariff/TEU | 811.1 | 298.5 | 924.6 | 313.3 | 924.6 | 281.3 | 281.3 | 281.3 | 281.3 | 281.3 |
| Average Foreign Ship Revenue ('000) | 41.4 | 35.8 | 47.2 | 41.6 | 47.2 | 37.8 | 37.8 | 37.8 | 37.8 | 37.8 |
| Average Domestic Ship Revenue ('000) | 10.5 | 5.2 | 12.0 | 6.1 | 12.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Number of Employees | 9,427 | 7,910 | 9,321 | 7,680 | 9,221 | 7,248 | 7,200 | 7,200 | 7,200 | 7,178 |
| Throughput/Employees ('000) Tons | 2,206 | 2,361 | 2,262 | 2,964 | 2,318 | 3,869 | 4,398 | 5,300 | 5,441 | 4,766 |
| Revenue | Appraisal | Actual | Appraisal | Actual | Appraisal | Tentative | Forecast | Forecast | Forecast | Forecast |
| Cargo Handling Charges | 828,112 | 240,300 | 962,929 | 315,000 | 983,225 | 357,600 | 419,700 | 481,000 | 507,884 | 502,632 |
| Foreign | 428,762 | 159,500 | 484,287 | 228,600 | 479,000 | 255,400 | 296,500 | 318,600 | 333,106 | 343,099 |
| Domestic | 220,592 | 42,000 | 254,480 | 48,800 | 257,647 | 57,200 | 61,200 | 81,400 | 81,966 | 57,440 |
| Container | 178,758 | 38,800 | 224,162 | 37,600 | 246,578 | 45,000 | 62,000 | 81,000 | 92,813 | 102,094 |
| Ship Charges | 49,814 | 35,500 | 57,400 | 42,900 | 58,042 | 52,700 | 60,500 | 66,500 | 68,519 | 69,839 |
| Foreign | 41,089 | 32,400 | 47,346 | 39,200 | 47,876 | 49,200 | 56,800 | 61,700 | 63,541 | 64,811 |
| Domestic | 8,725 | 3,100 | 10,054 | 3,700 | 10,166 | 3,500 | 3,700 | 4,800 | 4,978 | 5,028 |
| Other Services | 92,146 | 125,200 | 106,177 | 91,100 | 107,366 | 75,400 | 79,800 | 70,500 | 73,396 | 71,927 |
| Less: Business Tax | 31,721 | 13,113 | 36,837 | 14,682 | 37,550 | 15,882 | 18,312 | 20,209 | 21,248 | 21,072 |
| Net Operating Revenue | 938,351 | 387,887 | 1,089,669 | 434,318 | 1,111,083 | 469,818 | 541,688 | 597,791 | 628,550 | 623,327 |
| Working Expenses | 468,831 | 279,700 | 504,236 | 308,000 | 542,644 | 345,500 | 362,000 | 404,700 | 443,721 | 423,012 |
| Personnel | 72,552 | 64,000 | 76,845 | 69,500 | 81,435 | 76,100 | 83,700 | 100,400 | 101,605 | 102,516 |
| Fuel & Materials | 173,858 | 71,000 | 188,749 | 63,300 | 205,022 | 73,600 | 81,000 | 97,000 | 101,815 | 90,913 |
| Maintenance | 26,634 | 15,700 | 28,838 | 15,100 | 31,238 | 20,100 | 22,000 | 26,400 | 27,507 | 24,382 |
| Administration | 97,690 | 86,430 | 103,588 | 107,267 | 109,894 | 117,719 | 117,451 | 121,203 | 102,141 | 127,225 |
| Others | 98,097 | 42,570 | 106,216 | 52,833 | 115,055 | 57,981 | 57,849 | 59,697 | 110,653 | 77,976 |
| Depreciation Expenses | 221,107 | 105,100 | 247,838 | 97,200 | 277,228 | 105,300 | 106,000 | 110,500 | 113,463 | 127,704 |
| Total Operating Expenses | 689,938 | 384,800 | 752,074 | 405,200 | 819,872 | 450,800 | 468,000 | 515,200 | 557,184 | 550,715 |
| Operating Profit (Loss) | 248,413 | 3,087 | 337,595 | 29,118 | 291,211 | 19,018 | 73,688 | 82,591 | 71,366 | 72,611 |
| Nonoperating Income | 11,269 | 3,600 | 12,091 | 2,900 | 12,973 | 400 | 2,418 | 400 | 2,127 | 2,086 |
| Nonoperating Expenses | 10,367 | 5,450 | 11,122 | 3,800 | 11,934 | 10,200 | 7,500 | 7,000 | 7,105 | 7,212 |
| Interest Expenses | 135,401 | 35,200 | 129,219 | 26,350 | 122,492 | 67,700 | 70,350 | 102,208 | 95,264 | 87,983 |
| Net Profit (Loss) Before Tax | 113,914 | (33,963) | 209,345 | 1,868 | 169,758 | (58,482) | (1,744) | (26,217) | (28,875) | (20,497) |
| Income Tax Payable | 37,591 | 850 | 69,084 | 850 | 56,017 | 900 | 900 | 900 | 0 | 0 |
| Net Profit (Loss) for the Year | 76,323 | (34,813) | 140,261 | 1,018 | 113,741 | (59,382) | (2,644) | (27,117) | (28,875) | (20,497) |
| Performance Indicators | | | | | | | | | | |
| Working Ratio (covenanted at <=55%) | 50% | 72% | 46% | 71% | 49% | 74% | 67% | 68% | 71% | 68% |
| Operating Ratio | 74% | 99% | 69% | 93% | 74% | 96% | 86% | 86% | 89% | 88% |

TEU = twenty-foot equivalent unit.
Source: Yantai Port Authority and ADB staff estim

continued on next page

Table A11 – Continued
(CNY '000)

| Item | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual |
| Balance Sheet | | | | | | | | | | |
| Current Assets: | 309,804 | 400,847 | 347,091 | 385,417 | 492,333 | 496,654 | 527,220 | 473,489 | 730,443 | 561,744 |
| Cash | 137,182 | 186,270 | 133,485 | 199,386 | 206,913 | 224,915 | 231,240 | 108,210 | 364,977 | 173,844 |
| Receivables | 130,837 | 101,044 | 166,113 | 127,550 | 224,971 | 240,843 | 232,034 | 140,890 | 292,203 | 162,900 |
| Inventory, Prepaid Expenses, & Others | 41,785 | 113,533 | 47,493 | 58,481 | 60,449 | 30,896 | 63,946 | 224,389 | 73,263 | 225,000 |
| Fixed Assets: | 1,744,853 | 1,630,321 | 2,281,587 | 1,941,730 | 2,629,280 | 2,275,435 | 3,338,134 | 2,270,411 | 3,753,901 | 2,204,256 |
| Gross Assets in Service | 1,487,200 | 1,286,426 | 1,926,530 | 1,316,223 | 2,475,979 | 2,197,344 | 3,061,355 | 2,333,786 | 3,841,068 | 2,267,900 |
| Less: Accumulated Depreciation | 254,259 | 276,507 | 350,585 | 334,331 | 474,384 | 386,602 | 627,452 | 478,408 | 819,506 | 538,900 |
| Net Assets in Service | 1,232,941 | 1,009,919 | 1,575,945 | 981,892 | 2,001,595 | 1,810,742 | 2,433,903 | 1,855,378 | 3,021,562 | 1,729,000 |
| Capital-Work-in-Progress | 431,827 | 558,469 | 601,899 | 907,139 | 494,355 | 422,205 | 739,379 | 362,042 | 525,499 | 421,600 |
| Other Fixed Assets | 80,085 | 61,933 | 103,743 | 52,699 | 133,330 | 42,488 | 164,852 | 52,991 | 206,840 | 53,656 |
| Total Assets | 2,054,657 | 2,031,168 | 2,628,678 | 2,327,147 | 3,121,613 | 2,772,089 | 3,865,354 | 2,743,900 | 4,484,344 | 2,766,000 |
| Current Liabilities: | 199,953 | 268,285 | 161,414 | 334,408 | 196,431 | 454,824 | 205,741 | 429,920 | 229,845 | 460,700 |
| Payables | 119,000 | 268,019 | 90,243 | 333,647 | 115,357 | 408,301 | 122,246 | 423,562 | 140,214 | 296,700 |
| Other Short-Term Liabilities | 80,953 | 266 | 71,171 | 761 | 81,074 | 46,523 | 83,495 | 6,358 | 89,631 | 164,000 |
| Long-Term Liabilities: | 486,780 | 800,310 | 835,989 | 823,493 | 1,028,500 | 1,035,186 | 1,452,958 | 1,008,056 | 1,658,047 | 992,100 |
| Borrowing from ADB (First Yantai Project) | 232,458 | 186,596 | 382,406 | 265,397 | 372,976 | 383,790 | 362,895 | 324,169 | 352,118 | 317,146 |
| Borrowing from ADB (the Project) | 0 | 0 | 107,100 | 0 | 214,200 | 436 | 428,400 | 40,225 | 535,500 | 96,443 |
| China Development Bank | 0 | 178,080 | 102,372 | 256,950 | 213,373 | 368,779 | 450,915 | 361,376 | 578,000 | 425,362 |
| Other Long-Term Liabilities | 254,322 | 435,634 | 244,111 | 301,146 | 227,951 | 282,181 | 210,748 | 282,286 | 192,429 | 153,149 |
| Equity | 1,367,924 | 962,573 | 1,631,275 | 1,169,246 | 1,896,682 | 1,282,079 | 2,206,655 | 1,305,924 | 2,596,452 | 1,313,200 |
| Paid-In-Capital | 909,645 | 609,759 | 947,157 | 778,803 | 968,377 | 804,438 | 1,013,790 | 824,453 | 1,038,085 | 874,500 |
| Retained Earnings and Other Reserves | 85,525 | 70,208 | 162,644 | 99,242 | 271,973 | 116,307 | 363,215 | 120,137 | 514,422 | 78,700 |
| Reevaluation Reserves | 372,754 | 282,606 | 521,474 | 291,201 | 656,332 | 361,334 | 829,650 | 361,334 | 1,043,945 | 360,000 |
| Total Liabilities & Capital | 2,054,657 | 2,031,168 | 2,628,678 | 2,327,147 | 3,121,613 | 2,772,089 | 3,865,354 | 2,743,900 | 4,484,344 | 2,766,000 |
| Return on Net Asset (covenanted at =>7%) | 7.4% | 7.2% | 9.3% | 6.3% | 11.5% | 4.2% | 7.9% | 0.03% | 9.7% | 2.2% |
| Debt-to-Equity Ratio | 35.6% | 83.1% | 51.2% | 70.4% | 54.2% | 80.7% | 65.8% | 77.2% | 63.9% | 75.5% |

continued on next page

Source: Yantai Port Authority and ADB staff estimates.

Table A11 – Continued
(CNY '000)

| Item | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|----------------|----------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual | Appraisal | Actual |
| Cash Flow Statements | | | | | | | | | | |
| Source of Funds: | | | | | | | | | | |
| Funds from Operations | 155,081 | 122,200 | 228,236 | 123,583 | 329,549 | 119,479 | 330,127 | 97,929 | 456,801 | 143,837 |
| Operating Profit (Loss) | 80,153 | 70,310 | 131,282 | 63,207 | 205,043 | 58,401 | 176,298 | 547 | 263,914 | 39,337 |
| Add-Back Depreciation | 74,360 | 56,489 | 96,326 | 62,941 | 123,799 | 64,126 | 153,068 | 105,100 | 192,053 | 105,100 |
| Net Nonoperating Income | 568 | (4,599) | 628 | (2,565) | 707 | (3,048) | 761 | (7,718) | 834 | (600) |
| Funds from Financing | 207,517 | 217,850 | 404,878 | 335,501 | 239,322 | 265,490 | 497,154 | 59,804 | 258,481 | 175,148 |
| Government's Capital Contribution | 37,798 | 14,218 | 37,512 | 169,044 | 21,221 | 25,635 | 45,412 | 20,015 | 24,296 | 50,047 |
| Other Loans / Bond issue | 19,770 | 95,146 | 110,317 | 87,656 | 111,001 | 121,026 | 237,542 | 0 | 127,085 | 68,786 |
| Loan from ADB | 149,949 | 108,486 | 257,049 | 78,801 | 107,100 | 118,829 | 214,200 | 39,789 | 107,100 | 56,315 |
| Total Source | 362,598 | 340,050 | 633,114 | 459,084 | 568,871 | 384,969 | 827,281 | 157,733 | 715,282 | 318,985 |
| Application of Funds: | | | | | | | | | | |
| Capital Expenditure | 217,722 | 167,255 | 460,682 | 333,732 | 307,047 | 215,607 | 657,081 | 90,034 | 351,538 | 80,727 |
| Change in Working Capital and Others | 62,188 | 22,431 | 103,179 | (93,867) | 66,387 | 62,169 | 32,772 | 95,758 | 87,368 | (7,555) |
| Debt Service | 34,624 | 32,159 | 34,968 | 158,913 | 68,162 | 55,952 | 68,161 | 86,237 | 68,162 | 177,780 |
| Interest Payment | 16,575 | 19,211 | 16,809 | 15,639 | 42,574 | 27,790 | 40,877 | 28,904 | 39,066 | 37,600 |
| Principal Repayment | 18,049 | 12,948 | 18,159 | 143,274 | 25,588 | 28,162 | 27,284 | 57,333 | 29,096 | 140,180 |
| Tax Paid and Distribution of Net Profit | 21,168 | 42,222 | 37,984 | 47,190 | 53,848 | 25,712 | 44,940 | 2,409 | 74,475 | 2,400 |
| Total Application | 335,702 | 264,067 | 636,813 | 445,968 | 495,444 | 359,440 | 802,954 | 274,438 | 581,543 | 253,352 |
| Net Cash Flow for the Year | 26,896 | 75,983 | (3,699) | 13,116 | 73,427 | 25,529 | 24,327 | (116,705) | 133,739 | 65,633 |
| Cash Position at the Beginning | 110,287 | 110,287 | 137,183 | 186,270 | 133,484 | 199,386 | 206,911 | 224,915 | 231,238 | 108,210 |
| Cash Position at the End | 137,183 | 186,270 | 133,484 | 199,386 | 206,911 | 224,915 | 231,238 | 108,210 | 364,977 | 173,844 |
| Debt-Service Coverage Ratio | 4.5 | 3.8 | 6.5 | 0.8 | 4.8 | 2.1 | 4.8 | 1.1 | 6.7 | 0.8 |

continued on next page

Source: Yantai Port Authority and ADB staff estimates.

Table A11 – Continued

(CNY '000)

| Item | 2000 | | 2001 | | 2002 | | 2003 | 2004 | 2005 | 2006 |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Tentative | Forecast | Forecast | Forecast | Forecast |
| Balance Sheet | | | | | | | | | | |
| Current Assets: | 722,929 | 770,500 | 781,157 | 681,900 | 817,323 | 587,201 | 511,771 | 528,887 | 543,312 | 532,073 |
| Cash | 328,726 | 301,400 | 330,377 | 265,500 | 352,954 | 339,101 | 270,878 | 260,951 | 260,662 | 254,517 |
| Receivables | 312,783 | 187,700 | 363,224 | 180,800 | 370,358 | 192,300 | 186,667 | 206,000 | 216,599 | 214,799 |
| Inventory, Prepaid Expenses, & Others | 81,420 | 281,400 | 87,556 | 235,600 | 94,011 | 55,800 | 54,227 | 61,937 | 66,050 | 62,756 |
| Fixed Assets: | 4,053,392 | 2,303,400 | 4,379,755 | 2,608,600 | 4,733,525 | 2,642,700 | 2,656,815 | 2,546,315 | 2,432,852 | 2,739,313 |
| Gross Assets in Service | 4,422,149 | 2,259,500 | 4,956,761 | 3,144,000 | 5,544,550 | 3,191,600 | 3,459,235 | 3,459,235 | 3,459,235 | 3,893,399 |
| Less: Accumulated Depreciation | 1,040,613 | 625,900 | 1,288,451 | 691,100 | 1,565,679 | 775,600 | 881,600 | 992,100 | 1,105,563 | 1,233,266 |
| Net Assets in Service | 3,381,536 | 1,633,600 | 3,668,310 | 2,452,900 | 3,978,871 | 2,416,000 | 2,577,635 | 2,467,135 | 2,353,672 | 2,660,133 |
| Capital-Work-in-Progress | 433,725 | 597,800 | 444,526 | 87,300 | 456,083 | 112,400 | 0 | 0 | 0 | 0 |
| Other Fixed Assets | 238,131 | 72,000 | 266,919 | 68,400 | 298,571 | 114,300 | 79,180 | 79,180 | 79,180 | 79,180 |
| Total Assets | 4,776,321 | 3,073,900 | 5,160,912 | 3,290,500 | 5,550,848 | 3,229,901 | 3,168,586 | 3,075,202 | 2,976,164 | 3,271,386 |
| Current Liabilities: | 251,043 | 494,277 | 266,423 | 640,600 | 282,970 | 622,600 | 450,300 | 482,325 | 511,591 | 496,059 |
| Payables | 156,277 | 401,100 | 168,079 | 447,100 | 180,881 | 443,800 | 271,500 | 303,525 | 332,791 | 317,259 |
| Other Short-Term Liabilities | 94,766 | 93,177 | 98,344 | 193,500 | 102,089 | 178,800 | 178,800 | 178,800 | 178,800 | 178,800 |
| Long-Term Liabilities: | 1,583,629 | 1,208,623 | 1,503,029 | 1,186,500 | 1,415,711 | 1,164,501 | 1,132,054 | 1,035,862 | 936,434 | 833,520 |
| Borrowing from ADB (First Yantai Project) | 340,598 | 310,106 | 328,283 | 303,366 | 315,118 | 295,412 | 0 | 0 | 0 | 0 |
| Borrowing from ADB (the Project) | 522,294 | 136,269 | 508,177 | 381,856 | 493,086 | 412,404 | 0 | 0 | 0 | 0 |
| China Development Bank | 547,820 | 618,740 | 514,438 | 401,040 | 477,514 | 364,446 | 1,132,054 | 1,035,862 | 936,434 | 833,520 |
| Other Long-Term Liabilities | 172,917 | 143,509 | 152,131 | 100,239 | 129,993 | 92,239 | 0 | 0 | 0 | 0 |
| Equity | 2,941,649 | 1,371,000 | 3,391,460 | 1,463,400 | 3,852,167 | 1,442,800 | 1,586,232 | 1,557,015 | 1,528,140 | 1,941,807 |
| Paid-In-Capital | 1,038,085 | 945,300 | 1,038,085 | 1,139,800 | 1,038,085 | 1,156,700 | 1,156,700 | 1,156,700 | 1,156,700 | 1,156,700 |
| Retained Earnings and Other Reserves | 590,744 | 39,900 | 731,005 | 5,700 | 844,738 | 5,700 | 956 | (28,261) | (57,136) | (77,633) |
| Reevaluation Reserves | 1,312,820 | 385,800 | 1,622,370 | 317,900 | 1,969,344 | 280,400 | 428,576 | 428,576 | 428,576 | 862,740 |
| Total Liabilities & Capital | 4,776,321 | 3,073,900 | 5,160,912 | 3,290,500 | 5,550,848 | 3,229,901 | 3,168,586 | 3,075,202 | 2,976,164 | 3,271,386 |
| Return on Net Asset (covenanted at =>7%) | 7.8% | 0.2% | 9.6% | 1.4% | 7.6% | 0.8% | 2.2% | 3.4% | 3.0% | 2.9% |
| Debt-to-Equity Ratio | 53.8% | 88.2% | 44.3% | 81.1% | 36.8% | 80.7% | 71.4% | 66.5% | 61.3% | 42.9% |

continued on next page

Source: Yantai Port Authority and ADB staff estimates.

Table A11 – Continued

(CNY '000)

| Item | 2000 | | 2001 | | 2002 | | 2003 | 2004 | 2005 | 2006 |
|---|-----------------|----------------|----------------|-----------------|----------------|----------------|------------------|----------------|----------------|----------------|
| | Appraisal | Actual | Appraisal | Actual | Appraisal | Tentative | Forecast | Forecast | Forecast | Forecast |
| Cash Flow Statements | | | | | | | | | | |
| Source of Funds: | | | | | | | | | | |
| Funds from Operations | 470,422 | 106,337 | 586,402 | 125,418 | 569,478 | 114,518 | 174,606 | 186,491 | 179,851 | 195,190 |
| Operating Profit (Loss) | 248,413 | 3,087 | 337,595 | 29,118 | 291,211 | 19,018 | 73,688 | 82,591 | 71,366 | 72,611 |
| Add-Back Depreciation | 221,107 | 105,100 | 247,838 | 97,200 | 277,228 | 105,300 | 106,000 | 110,500 | 113,463 | 127,704 |
| Net Nonoperating Income | 902 | (1,850) | 969 | (900) | 1,039 | (9,800) | (5,082) | (6,600) | (4,978) | (5,125) |
| Funds from Financing | 0 | 308,696 | 0 | 492,222 | 0 | 18,102 | 806,995 | 0 | 0 | 0 |
| Government's Capital Contribution | 0 | 70,800 | 0 | 194,500 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Loans / Bond issue | 0 | 197,954 | 0 | 52,300 | 0 | 0 | 806,995 | 0 | 0 | 0 |
| Loan from ADB | 0 | 39,942 | 0 | 245,422 | 0 | 18,102 | 0 | 0 | 0 | 0 |
| Total Source | 470,422 | 415,033 | 586,402 | 617,640 | 569,478 | 132,620 | 981,601 | 186,491 | 179,851 | 195,190 |
| Application of Funds: | | | | | | | | | | |
| Capital Expenditure | 220,432 | 162,981 | 235,863 | 508,478 | 252,373 | 26,792 | 0 | 0 | 0 | 0 |
| Change in Working Capital and Others | 38,830 | 66,123 | 69,987 | (203,823) | 28,693 | (103,700) | 130,094 | (4,982) | (14,553) | 10,438 |
| Debt Service | 209,818 | 56,073 | 209,818 | 346,735 | 209,819 | 132,927 | 916,731 | 198,400 | 194,692 | 190,897 |
| Interest Payment | 135,400 | 35,200 | 129,218 | 26,350 | 122,492 | 67,700 | 70,350 | 102,208 | 95,264 | 87,983 |
| Principal Repayment | 74,418 | 20,873 | 80,600 | 320,385 | 87,327 | 65,227 | 846,381 | 96,192 | 99,429 | 102,914 |
| Tax Paid and Distribution of Net Profit | 37,591 | 2,300 | 69,084 | 2,150 | 56,017 | 3,000 | 3,000 | 3,000 | 0 | 0 |
| Total Application | 506,671 | 287,476 | 584,752 | 653,540 | 546,902 | 59,019 | 1,049,825 | 196,419 | 180,140 | 201,334 |
| Net Cash Flow for the Year | (36,249) | 127,557 | 1,650 | (35,900) | 22,576 | 73,601 | (68,223) | (9,927) | (289) | (6,145) |
| Cash Position at the Beginning | 364,977 | 173,844 | 328,728 | 301,400 | 330,378 | 265,500 | 339,101 | 270,878 | 260,951 | 260,662 |
| Cash Position at the End | 328,728 | 301,400 | 330,378 | 265,500 | 352,954 | 339,101 | 270,878 | 260,951 | 260,662 | 254,517 |
| Debt-Service Coverage Ratio | 2.2 | 1.9 | 2.8 | 0.4 | 2.7 | 0.9 | 0.2 | 0.9 | 0.9 | 1.0 |

Source: Yantai Port Authority and ADB staff estimates.

FINANCIAL REEVALUATION

1. The financial internal rate of return (FIRR) for the Project is computed in mid-2003 constant prices for the same project period (25 years, from 1997 to 2021) using the same methodology used at appraisal but based on (i) the actual capital costs; (ii) the revised traffic forecast, including throughputs and ship calls; (iii) the assumed average revenue, by type of business (ship call, bulk and semibulk cargo handling, and container handling), taken from actual Yantai Port Authority (YTPA) figures; and (iv) the estimated incremental maintenance and operating costs reflecting the actual YTPA expenditures. The capital costs exclude financial charges during construction. Business tax assumption remains unchanged, while income tax was not assumed at appraisal but at the project completion review. The average revenues are assumed to remain at the same level in constant prices for the Project's life as at the current level in mid-2003 constant prices.

2. The real weighted average cost of capital (WACC) for the port component is estimated at 4.4%, comprising the after-tax borrowing cost for each debt from the China Development Bank (hard loan and soft loan) and the cost of capital injected from the Ministry of Communications and YTPA. The cost of equity capital is calculated based on the current 30-year swap rate for US dollars plus the prevailing margin imposed in the market on the Government of the People's Republic of China (PRC). This was considered a marginal cost of capital for the Government of the PRC. The assumption is made that the fully prepaid ADB loan was refinanced with the China Development Bank's long-term hard loan at the current premium interest rate.

3. The reevaluated FIRR is 8.1%, which compares with the 7.2% at appraisal (Table A12). The increased FIRR is attributable mainly to smaller capital costs by 25.0%. A positive outlook for future traffic is also a contributing factor. During implementation, the FIRR was reviewed twice, once by the Midterm Review Mission in 1998 and once by the Special Loan Administration Mission in 1999. The low FIRR assessed by the Midterm Review Mission reflected pessimistic prospects for YTPA's financial performance and future traffic, which bottomed in 1998. During the Special Loan Administration Mission, a major change of scope that involved using surplus loan funds was discussed. The proposed change comprised additional dredging work to accommodate larger vessels, container vessels in particular, at project berths. With and without additional work analyses were undertaken and indicated that without additional work, the FIRR would decline to 4.5%, against 6.8% for the with additional work case. In 2000, ADB approved the proposed change of scope. Although only a 1-year operating track was available for the project berths, the additional dredging work expanded the capacity and is likely to realize the estimated benefits. The project berths are expected to be fully used by container vessels in 2010 and for bulk and/or semibulk cargo in 2005.

4. The sensitivity analysis was undertaken with respect to tariff levels. In the case that all average unit revenues were decreased by 10% every 3 years from 2005, the FIRR would decline to 5.7%. If the decrease is 15.5% every 3 years, the FIRR would reach its breakeven at 4.4%, and the Project would lose its financial viability. The FIRR is most sensitive to container tariffs, followed by the foreign cargo handling fee. The FIRR is also sensitive to throughputs. The FIRR would decline to the WACC in any of the following cases: (i) if container volume decreased by 24%, (ii) if cargo volume decreased by 60%, and (iii) if container and bulk cargo ship calls and handling volume were reduced by 14% each. The probability of the FIRR being higher than the WACC, with respect to container traffic and ship calls, was estimated at 69.8%. The Project is therefore considered financially viable, and its resistance to risks is satisfactory.

Table A12: Financial Internal Rate of Return of Second Yantai Port Project
(CNY million)

| Year | Cost | | | | | | Revenue | | | | Net Cash Flow |
|-------------|--------------|--|------------------------------|--------------------------------|--------------|------------|---|------------------------------------|-------------------|---------------|---------------|
| | Capital Cost | Major Rehabilitation / Equipment Replacement | Incremental Maintenance Cost | Incremental Operating Expenses | Business Tax | Income Tax | Cargo Handling Revenue (Bulk / Semi-Bulk cargo) | Cargo Handling Revenue (Container) | Ship Call Revenue | Other Revenue | |
| 1997 | 117.0 | — | — | — | — | — | — | — | — | — | (117.0) |
| 1998 | 127.0 | — | — | — | — | — | — | — | — | — | (127.0) |
| 1999 | 135.0 | — | — | — | — | — | — | — | — | — | (135.0) |
| 2000 | 167.0 | — | — | — | — | — | — | — | — | — | (167.0) |
| 2001 | 385.0 | — | — | — | — | — | — | — | — | — | (385.0) |
| 2002 | 0.0 | — | 7.8 | 26.9 | 3.9 | 10.7 | 54.5 | 27.4 | 20.0 | 16.4 | 69.0 |
| 2003 | — | — | 14.2 | 47.0 | 6.1 | 23.9 | 71.5 | 53.4 | 38.0 | 24.0 | 95.7 |
| 2004 | — | — | 14.2 | 60.8 | 6.9 | 27.3 | 72.2 | 70.3 | 46.9 | 22.3 | 102.5 |
| 2005 | — | — | 14.2 | 63.9 | 7.3 | 30.1 | 79.0 | 72.4 | 49.1 | 23.4 | 108.3 |
| 2006 | — | — | 14.2 | 65.5 | 7.8 | 34.3 | 88.7 | 74.6 | 50.6 | 24.7 | 116.8 |
| 2007 | — | — | 14.2 | 66.9 | 7.9 | 35.1 | 88.8 | 76.8 | 52.1 | 25.0 | 118.5 |
| 2008 | — | — | 14.2 | 68.5 | 8.1 | 36.0 | 88.8 | 79.1 | 53.7 | 25.3 | 120.1 |
| 2009 | — | — | 14.2 | 70.3 | 8.2 | 36.8 | 88.8 | 81.5 | 55.4 | 25.5 | 121.8 |
| 2010 | — | — | 14.2 | 72.2 | 8.4 | 37.5 | 88.8 | 84.0 | 57.1 | 25.8 | 123.4 |
| 2011 | — | — | 14.2 | 72.3 | 8.4 | 37.4 | 88.6 | 84.0 | 57.2 | 25.7 | 123.1 |
| 2012 | — | — | 14.2 | 72.3 | 8.3 | 37.4 | 88.4 | 84.0 | 57.4 | 25.6 | 123.1 |
| 2013 | — | 46.8 | 14.2 | 72.2 | 8.3 | 37.4 | 88.2 | 84.0 | 57.5 | 25.5 | 76.2 |
| 2014 | — | — | 14.2 | 72.2 | 8.3 | 37.3 | 88.0 | 84.0 | 57.6 | 25.4 | 122.9 |
| 2015 | — | — | 14.2 | 72.2 | 8.3 | 37.2 | 87.8 | 84.0 | 57.8 | 25.3 | 122.7 |
| 2016 | — | 174.6 | 14.2 | 72.2 | 8.3 | 37.1 | 87.3 | 84.0 | 57.9 | 25.3 | (52.1) |
| 2017 | — | — | 14.2 | 72.3 | 8.3 | 37.0 | 86.8 | 84.0 | 58.1 | 25.3 | 122.3 |
| 2018 | — | — | 14.2 | 72.2 | 8.3 | 36.9 | 86.3 | 84.0 | 58.2 | 25.3 | 122.1 |
| 2019 | — | — | 14.2 | 72.2 | 8.3 | 36.8 | 85.9 | 84.0 | 58.3 | 25.2 | 121.8 |
| 2020 | — | — | 14.2 | 72.2 | 8.3 | 36.7 | 85.4 | 84.0 | 58.5 | 25.2 | 121.6 |
| 2021 | (118.2) | — | 14.2 | 72.2 | 8.3 | 36.7 | 85.4 | 84.0 | 58.5 | 25.2 | 239.8 |
| WACC | | | | | | | | | 4.4% | FIRR | 8.1% |

— = no data available, FIRR = financial internal rate of return, MTR = mid-term review, SLAM = special loan administration mission, WACC = weighted average cost of capital.

Source: ADB staff estimates.

| | FIRR | WACC |
|------------------|-------------|-------------|
| FIRR (Appraisal) | 7.2% | n.a. |
| FIRR (MTR) | 6.7% | n.a. |
| FIRR (SLAM) | 6.8% | 6.3% |

ECONOMIC REEVALUATION

A. General

1. Economic reevaluation was conducted for the with and without project cases, using updated data. The costs were adjusted to actual project capital costs and updated project operation and maintenance costs. The benefits were recalculated using actual port traffic in 2002 and newly forecasted traffic for future years. All parameters for benefit calculation were checked and updated. The EIRR was then recalculated, using the revised costs and benefits. The recalculated EIRR was 17.6%, which was slightly lower than that at appraisal. The change was mainly due to an increase in operating costs.

B. Costs

2. The Project's cost was composed of three parts: (i) capital costs, (ii) maintenance costs (including routine and major replacement costs), and (iii) operating costs. Actual capital costs were about 27% lower than those at appraisal. The change was mainly caused by cost savings in contingency fees and civil works. The operation and maintenance costs were adjusted according to real port expenditures in 2002 and the latest estimates for future years. Operating costs were about double those at appraisal, mainly due to higher throughput at project berths. All of these costs were converted into economic costs, using a standard conversion factor of 0.9.

C. Benefits

3. Four types of economic benefits were recalculated by comparing the with and without project cases. The benefits included (i) turnaround time cost savings for container vessels at project berths, (ii) turnaround time cost savings for conventional cargo vessels at project berths, (iii) turnaround time cost savings for cargo vessels at existing berths, and (iv) avoidance of land transport cost savings.

4. **Container Vessel Time Cost Savings at Project Berths.** Container handling speed was about 15 twenty-foot equivalent units (teu) per hour, using exiting berths and facilities. In 2002, handling speed was about 30 teu per hour, using dedicated project berths with advanced facilities. An average load and unload per vessel of 153 teu was applied. The average time savings was calculated to be about 0.21 days per vessel. The average operating cost of container vessels at Yantai port was about CNY91,800 per day in 2002. The average turnaround cost savings was calculated to be CNY19,570 per vessel, which was applied to the forecasted number of container vessels over the evaluation years.

5. **Conventional Vessel Time Cost Savings at Project Berths.** According to the Executing Agency's statistics, the average handling time for conventional cargo at Yantai port was 0.13 days and 0.12 days per thousand tons in 2001 and 2002, respectively. The cargo handled at project conventional cargo berths was mainly iron ore. The vessels hauling iron ore were much bigger than port average, and the handling efficiency was much higher than port average. It was therefore assumed that the iron ore handling time at project berths was about 80% and 70% of port average in 2001 and 2002, respectively. The time savings for conventional cargo vessels at project berths was calculated to be 1.18 days per vessel. The average operating cost for vessels at project conventional cargo berths was about CNY90,000 per vessel per day. So, the turnaround time cost savings for conventional cargo vessels at project berths was calculated to be CNY105,780 per vessel. The cost savings were applied to the forecasted traffic at project conventional cargo berths.

6. **Cargo Vessel Time Cost Savings at Existing Berths.** Due to the operation of project berths, about 20% of the cargo in 2002 was diverted from existing berths to project berths. This apparently reduced congestion (by reducing calling and handling times) at existing berths. So, such vessel turnaround time cost savings should be also included in project benefits. Average time savings for vessels at exiting berths was calculated to be 0.19 days per vessel, and the average vessel turnaround time cost savings was CNY17,680 per vessel in 2002. However, this time savings might not be caused only by the operation of project berths. For this reason, only 50% of the calculated cost savings was included in project benefits. This unit cost savings was then applied to traffic at existing berths over evaluation years.

7. **Avoidance of Land Transport Cost Savings.** In the without project case, most container traffic would be diverted to Qingdao port, which is about 200 kilometers from Yantai. The diverted traffic would then be transported to Yantai by land. In the with project case, this land transport cost would be avoided. According to assumptions, 80% of container traffic and 30% of conventional traffic at project berths might be diverted to land transport in the without case. Land transport costs were estimated at CNY4.59 per teu-kilometer for container cargo and CNY0.10 per ton-kilometer for conventional cargo. These unit land transport costs were applied to likely diverted cargos over the evaluation years.

D. Reevaluation of the Economic Internal Rate of Return

8. The recalculated EIRR was 17.6%. The EIRR was slightly lower than that at appraisal (18.5%). The change was mainly caused by increased operating costs (about double). However, actual capital costs were reduced, and reforecasted traffic was higher than that at appraisal, which brought more benefits. Nevertheless, the recalculated EIRR exceeded the social discount rate of 12%. The Project can therefore maintain its strong economic viability.

9. A sensitivity analysis was carried out on project benefits. If the benefits were reduced by 10.0% and 20.0%, due to certain reasons, the EIRR would be 15.6% and 13.5%, respectively. If the benefits were increased by 10.0% and 20.0%, due to increasing traffic, reducing operating costs, enhancing management, improving efficiency, etc., the EIRR would be 19.4% and 21.0%, respectively.

10. According to the consultant's analysis, socioeconomic development would maintain a fast pace in the Yantai area. Socioeconomic development will definitely cause a high-speed increase in port traffic, especially container traffic. In the meantime, the Yantai Port Authority is working hard to improve port management and increase port throughput by expanding business. Therefore, the forecasted traffic will be achieved, which will bring higher benefits.

Table A13: Economic Internal Rate of Return

| Year | Cost | | | Benefit | | | | | Net Benefit | Present Value | Accumulate of PV |
|------|---------|-----|-------|----------------------|------------------|-------------|-------------------------|-------|-------------|---------------|------------------|
| | Capital | M&O | Total | Turnaround Container | Cost Saving Bulk | Avoid Exist | Transport | Total | | | |
| 1996 | | | | | | | | | | | |
| 1997 | 105 | | 105 | | | | | | (105) | (84) | (84) |
| 1998 | 114 | | 114 | | | | | | (114) | (81) | (165) |
| 1999 | 122 | | 122 | | | | | | (122) | (77) | (243) |
| 2000 | 150 | | 150 | | | | | | (150) | (85) | (328) |
| 2001 | 347 | | 347 | | | | | | (347) | (176) | (503) |
| 2002 | | 61 | 61 | 13 | 8.6 | 10 | 101 | 132 | 71 | 32 | (471) |
| 2003 | | 76 | 76 | 24 | 10.8 | 11 | 175 | 222 | 146 | 59 | (412) |
| 2004 | | 79 | 79 | 32 | 11.7 | 14 | 222 | 280 | 200 | 72 | (340) |
| 2005 | | 79 | 79 | 33 | 12.6 | 17 | 231 | 293 | 214 | 69 | (271) |
| 2006 | | 79 | 79 | 34 | 12.6 | 19 | 237 | 302 | 223 | 64 | (207) |
| 2007 | | 79 | 79 | 35 | 12.6 | 21 | 242 | 311 | 232 | 60 | (147) |
| 2008 | | 79 | 79 | 36 | 12.6 | 24 | 248 | 321 | 242 | 55 | (92) |
| 2009 | | 79 | 79 | 37 | 12.6 | 27 | 255 | 331 | 252 | 51 | (41) |
| 2010 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 48 | 7 |
| 2011 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 43 | 50 |
| 2012 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 38 | 88 |
| 2013 | | 122 | 122 | 38 | 12.6 | 30 | 261 | 342 | 220 | 29 | 117 |
| 2014 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 30 | 147 |
| 2015 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 27 | 175 |
| 2016 | | 237 | 237 | 38 | 12.6 | 30 | 261 | 342 | 105 | 10 | 184 |
| 2017 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 22 | 206 |
| 2018 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 19 | 225 |
| 2019 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 17 | 243 |
| 2020 | | 79 | 79 | 38 | 12.6 | 30 | 261 | 342 | 262 | 15 | 258 |
| 2021 | (335) | 79 | (256) | 38 | 12.6 | 30 | 261 | 342 | 597 | 35 | 278 |
| | | | | | | | Net Present Value | | 274 | | |
| | | | | | | | Benefit/Cost Ratio | | 1.36 | | |
| | | | | | | | Internal Rate of Return | | 17.6% | | |
| | | | | | | | Break Even Years | | 14.8 | | |
| | | | | | | | Discount Rate | | 12% | | |