China

Qingdao Development Project (Teleommunication)

Report Date: October 2002

Field Survey: July 2001

1. Project Profile and Japan's ODA Loan

Site map

Qingdao Telecommunications company

1.1 Background

In 1989, telephone density[1] in China was as low as 0.98% and its improvement was listed as a national key objective. Ministry of Posts & Telecommunications (presently, Ministry of Information Industry) planned to increase telephone density by 2000 as follows: 2.8% as national average; around 10% in urban areas; 1% or more in rural areas; 25% or more in major cities such as Beijing, Tianjin, Shanghai, and Guangzhou; 20% or more in provincial capital cities, cities of economic center, and coastal open cities; 5% or more in mid-sized cities and capital cities of prefectures.

Since Qingdao, one of the coastal open cities, remained behind in the development of telecommunications facilities, compared with that of industry, agriculture and economy, telephone density stayed only 1.7% as of 1989. Further, the number of subscribers' lines on waiting list for main lines[2] amounted to more than 46,000 and demand for main lines was estimated to increase 15% annually. The status of telecommunications in Qingdao city district as of 1989 is shown as follows.

Population (thousand)	GDP per capita (US$)	Exchange capacity (lines)	Exchange station (Stations)	Subscriber (lines)	Subscribes' lines on waiting list (lines)	Telephone density (%)	Rate of filled vacancy[3] (%)
2,036	348	51,780	10	35,420	46,013	1.7	43.5

Qingdao Posts & Telecommunications Administration Bureau formulated and implemented plans to develop telephone exchange system of 51,780 lines in The 7th 5-Year Plan (1986-1990)

[1] Telephone density is same as telephone diffusion rate (number of telephones per 100 inhabitants)

[2] The number of subscribers' lines on waiting list for main lines means the number of lines that are still kept waiting for opening of main lines though subscriptions have been made.

[3] Rate of filled vacancy = the number of subscribers/(the number of subscribers + the number of subscribers' lines on waiting list for main lines)

in order to respond to an increasing demand for telecommunications. Further, Qingdao Posts & Telecommunications Administration Bureau was in process of devising a development plan including additional 126,000 lines in order to raise telephone density up to 6.7% in The 8th 5-Year Plan (1991-1995).

1.2 Objectives

To develop 80,000 lines in total of in-city telephone exchanges at 7 stations in Qingdao city, and to construct a relay transmission channel and a center facility, together with subscriber cables, as a part of The 8th 5-Year Plan. This aims not only to expand and modernize telecommunications network but also to cope with tightened condition of telecommunications and an increasing future demand, in order to ensure further economic and social development in Qingdao.

1.3 Project scope

(1) Expansion of telephone exchange system of 80,000 lines at the 7 city stations in Qingdao city;
(2) Procurement of equipments for an operation/maintenance center;
(3) Expansion of transmission equipments such as optical cables and subscriber cables, etc.

ODA loan covers foreign currency portion of total project cost.

1.4 Borrower/Executing Agency

The Government of the People's Republic of China / Qingdao City Government

1.5 Outline of Loan Agreement

Loan Amount Loan Disbursed Amount	4,034 million yen 2,547million yen
Exchange of Notes Loan Agreement	March 1991 March 1991
Teams and Conditions Interest Rate Repayment Period (Grace Period) Procurement	 2.5%/year 30 (10year) years General untied
Final Disbursement Date	April 1996

2. Results and Evaluation

2.1 Relevance

This project aims at accelerating an increase in telephone density in Qingdao city as well as responding to tight condition of telecommunications and a growing demand in future, which is considered to have been consistent in accordance with the development plan and policy of the Chinese Government up to now since the time of appraisal.

Out of 6 main objectives of economic structure adjustment in The 10th 5-Year Plan

announced in March 2001, 3 items, such as “a remarkable improvement in informatization of national economy/society” “further development of infrastructure” and “an improvement in urbanization level” are all relevant to the improvement in telecommunications infrastructure. Above all, Chapter 6 Section2 of the plan, “Development of information infrastructure” states “We build up a database of basic conditions of the country, public information resources and macro economy, and further establish an information-exchanging service center installed with complete “Geographic Information System (GIS)” in order to promote the integration of the three networks of telecommunications, television and computer. It is obvious, in this context, that development of basic telecommunications infrastructure targeted by the project is essential to achievement of the whole objectives. Thus, the project still maintains its relevance.

Most of equipments that had been introduced by the project was recently renewed. However, the project played a substantial role as an initial investment and through the completion of basic construction, both of which are indispensable for the Chinese telecommunications industry to make a remarkable development. Therefore, the relevance of the project can be well appreciated.

2.2 Efficiency

2.2.1 Project scope

Construction/installation of relay transmission facilities, subscriber cables and related facilities were all implemented as planned, but the equipment of in-city telephone exchanges increased by 13,000 lines from the original plan. Since, when they undertook the implementation of the plan, a greater increase in demand was anticipated compared to the time of appraisal, it was definitely necessary to adjust the plan according to the demand forecast

2.2.2 Schedule

Despite some changes in the project scope as mentioned above, the project was carried out as scheduled.

2.2.3 Project cost

As shown in the Table of Main Plan/Result Comparison, the cost in foreign currency (2,547 million yen) fell below the plan (4,034 million yen), while that in local currency (167.47 million RMB) exceeded the plan (155.45 million RMB). The reason is that, though part of subscriber cables, electric power equipments and air conditioning units had been originally intended to be procured with foreign currency, all of them were actually purchased from domestic suppliers with local currency. This is owing to the fact that since domestic industries rapidly developed by introduction of foreign funds and technologies made it possible to procure the equipments locally, they judged that it would be more efficient to purchase them in China rather than by an international bidding which takes a comparatively long time.

2.3 Effectiveness

The project aims at responding to “a necessity to ease tightened telecommunications situation and an increasing demand in the future in Qingdao through expansion / modernization of its telecommunications network, so that an improvement in the telephone diffusion rate in Qingdao city can be achieved”. So long as we refer to the data available as indicated below, we can conclude that the objectives intended by this Project have been basically achieved.

2.3.1 Installation of telephone exchanges and operating status

The current status of telephone exchanges installed by the project is as shown in the Table of Main Plan and Result Comparison. The equipment has been operating without any troubles for 6 years (1993-1998) since its installation. With a rapid development of telecommunications sector, however, it became obvious that the telephone exchanges that had been introduced by the project could not respond to ISDN and V5.2 connection port, which prevented Qingdao from adopting broadband, and expanding networks. Therefore, the old equipments have been replaced with updated equipments since 1998.

2.3.2 Trend of telephone density

Telephone density in Qingdao city grew from 1.70% in 1990 to 6.5% in 1995 and to 27.80% in 2001 as shown below in the Table 1 "The trend of telephone density in Qingdao city". When the project was completed in 1994, the result had not reached the target of original plan, which had been set up based on the forecast at the time of appraisal. However, the telephone density has improved to such a remarkable extent that it has come to exceed the target in and after 1996. The reason that telephone density was below the target at the time of the project completion was owing to the time lag between the operation start in April 1994 and the time that users' demand began to surge briskly since then. However, even if such time lag is taken into consideration, the result in 1995 was fairly close to 6.7%, the target of The 8th 5-Year Plan, which indicates that the project has made a certain contribution to the improvement of telephone density in the city.

Table 1 Planned Target & Result about Telephone Density (Unit：%)

	1990	1991	1992	1993	1994 completion of the project	1995	1996	1997	1998	1999	2000	2001
Plan	2.50	3.27	4.09	5.56	6.74	8.57	9.79	10.85	12.03	13.35	14.80	16.41
Actual	1.70	N.A.	N.A.	N.A.	2.30	6.50	9.85	15.80	19.34	22.84	25.60	27.80

Source: Qingdao Telecommunications Company

2.3.3 Trend of telephone exchange capacity, subscribers' cables and subscriptions on waiting list for main lines

Regarding telephone exchange capacity in the early 1990s, Qingdao Telecommunications Bureaus set up 1.2million lines as its target of 2000, and exceeded this target in 2000 as shown in Table 2.

Regarding subscribers' cables and subscribers' lines on the waiting list for main lines, no comparison between result and target is possible because no target plan is available. However, comprehensive analysis of the results about exchange capacity, subscribers' cables and subscribers' lines on the waiting list for main lines would assure us that the completion of the project has contributed to easing tightened situation of telecommunications in Qingdao.

In other word, the subscribers' lines on the waiting list for main lines increased from 46,013 lines in 1989 to 48,300 lines in 1992, and in 1993 just before the completion of this Project, its number stayed at the higher level of 41,700 lines. However, within 5 years of the project completion, they experienced such a substantial improvement that subscribers' lines on the waiting list for main lines were completely eliminated.

Table2：telephone exchange capacity, subscribers' cables, subscribers' lines on the waiting list for main lines in Qingdao city

(unit: 1,000lines)

		1990	1991	1992	1993	1994 completion of the project	1995	1996	1997	1998	1999	2000
Exchange Capacity	Plan	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1,200.0
	Actual	60.9	75.9	121.0	240.0	342.0	557.0	N.A.	793.0	N.A.	1,283.0	1,320.0
Subscribers' cables		60.1	68.7	98.7	232.0	293.0	380.0	N.A.	N.A.	N.A.	703.0	925.0
Subscribers' lines on the waiting list for main lines		47.3	47.8	48.3	41.7	N.A.	N.A.	N.A.	N.A.	N.A	0	0

Source: Qingdao Telecommunication Company

2.3.4 In-city traffic[4], Out-city traffic and International traffic

The result of in-city traffic, out-city traffic and international traffic of Qingdao City Telephone Office shows a sound growth between 1993 (before the completion of the project) and 2000 (after the completion), which means that the usage of telephone facilities has been growing steadily.

Table3: In-city traffic, out-city traffic and international traffic of Qingdao city telephone

(Unit: million times /year)

Item	1993	1996	2000
In-city traffic	529.81	1,193.31	1,910.97
Out- of- city traffic	44.06	92.05	137.89
International traffic	1.66	4.56	5.83

Source: Qingdao Telecommunications Company

2.3.5 Financial Internal Rate of Return (FIRR)

Financial Internal Rate of Return (FIRR) calculated at the time of appraisal was 8.9%. Assumptions were:

(1) Project life: 20 years
(2) Benefit: Toll revenue/basic rate/installation cost/private leased circuit rate
(3) Cost: construction investment fund/administrative and maintenance and operation expense / taxes.

As a result of recalculation on basis of the following two assumptions, FIRR produced a negative rate of return, i.e. (1) project life was reduced to 10 years, taking it into consideration that the equipments of the project would not be used after 2001: (2) Regarding benefit and cost, we used actual data that was estimated based on the ratio of benefit and cost in the total revenue/cost of Qingdao Telecommunications Company. This is owing to the fact that investment recovery period was halved.

[4] Traffic means traffic volume of outgoing/incoming telephones: traffic density x average reserve hour, in other word, actual traffic volume offered according to user's use hour/times.

2.4 Impact

2.4.1 Socioeconomic impacts

It is presumed that an improvement in quality of telephone service and reliability will offer the target areas usefulness and convenience in social economic life, which will have a positive impact on not only an enhancement in social welfare for citizens but also active economic activities including foreign capitals.

2.4.2 Environmental impacts

In implementing the project, neither impacts on social environment such as land purchase and involuntary relocation of residents, nor any negative impacts on natural environment have been observed.

2.5 Sustainability

2.5.1 Operation and maintenance

It was assumed that the agency responsible for the operation and maintenance would be Qingdao Posts & Telecommunications Administration Bureau at the time of appraisal, but actually it was decided that Qingdao Telecommunications Company belonging to the SHANDONG Telecommunications Company, a subsidiary of China Telecom (Chinese Telephone and Telegraph Group Company) would take the responsibility for it since 1998[5].

The organizational structure of Qingdao Telecommunications Company is roughly divided into the (1) Administration Department and the (2) Operation Department. Administration department has 16 units and 218 staffs that takes a charge of management planning, consultation about policies and measures with authorities (central governments, higher agencies or leaders of communist party), and advertising/promotion. Operation department has total 20 units including units in charge of operation/maintenance of facilities and sales and local offices in various districts, and total 854 staffs. With corporate reorganization in Chinese telecommunication sector, changes in organization structure of Qingdao Telecommunications Company and personnel are anticipated in the future.

At present, the departments/centers responsible for telephone toll collection are Marketing Department, Telephone Toll Calculation Center, and Telephone Number Administration Center and their respective units. Departments/centers responsible for equipment maintenance are Equipment Maintenance Department, Exchangees' Equipment Maintenance Center, Power Source Equipment Maintenance Center, Transmission Equipment Maintenance Center, Network Administration/Monitoring Center and their units. All of the above are involved, directly or indirectly, in administration of their responsible areas respectively. It seems, therefore, that the existing organization system can respond well to telephone toll collection and equipment maintenance. It is unlikely that reorganizations of structure or changes in staffing to be expected in future will cause serious problems to technology and equipment maintenance capability,

[5] In 1998, the Ministry of Posts & Telecommunications and the Ministry of Electric Industries Bureau were integrated into the Ministry of Information and Industries. Triggered by the integration, Telecommunications Bureau, formerly belonged to the Ministry of Posts & Telecommunications, became Chinese Telephone and Telegraph Group Company (China Telecom), and Posts & Telecommunications Administration Bureau of each region became a company's subsidiary or a subsidiary's branch. Also, in 2002, China Telecom is being divided into Nangfang Company, which will succeed the name of Chinese Telecommunications company, and Beifang Company, which will be integrated with Chinese Network Communication Group Company. Shandong Telecommunications Company is going to be placed under the control of Beifang Company.

because they are provided continuously with human resources from qualified telecommunications universities such as Beijing University of Posts and Telecommunications and through in-house staff training (OJT).

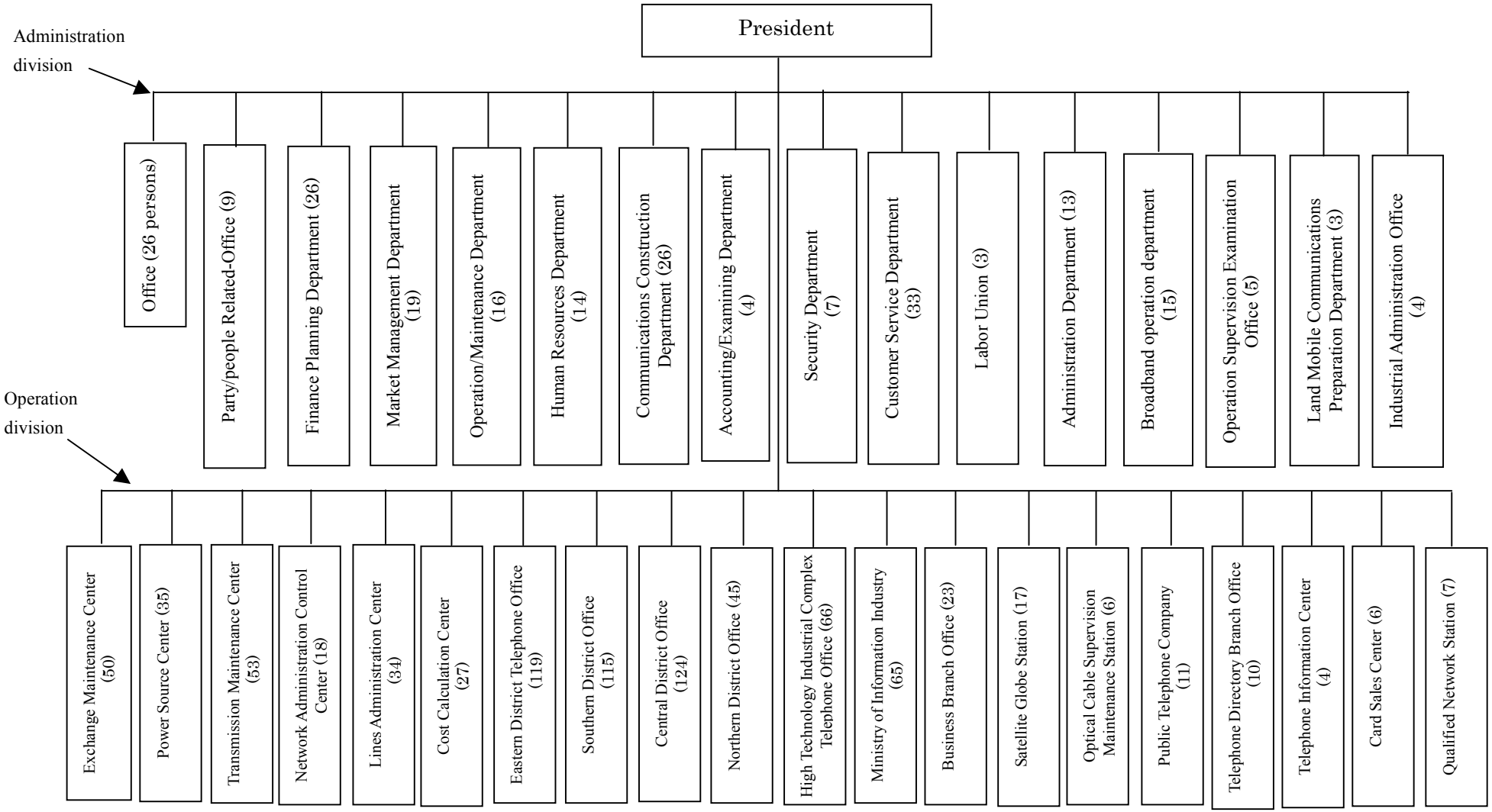
However, since split-up and reorganization of Chinese telecommunication sector is in progress, no detailed financial data could be obtained concerning agencies engaged in operation and maintenance.

Comparison of Original Plan and Actual Scope

Item	Plan	Actual
①Project scope		
(1)In-city exchange	80,000 lines	93,000 lines
Detail (Tangyi Lu)	15,000	20,000
(Guangxi Lu)	10,000	0
(Loushanhou)	5,000	8,000
(Shuiqinggou)	10,000	15,000
(Laoshan)	5,000	10,000
(Shandong Lu)	25,000	25,000
(Nanjing Lu)	10,000	15,000
(2)Relay transmission equipment	204corekm	204corekm
Optical cable		
Optical cable system	11system	11system
Detail 140Mb(1920ch)	6 system	6 system
34Mb(480ch)	310,500 Pair km	310,500 Pair km
(3)Subscriber cable	1,822km	1,822km
Length of conduit	O&M Center	O&M Center
(4)Construction of Shandong Lu telephone office	Commutator, air conditioner, vehicle	Commutator, air conditioner, vehicle
(5)Related facilities		
②Construction period		
Procurement/transportation of facilities	April 1990～April 1994	April 1990～April 1994
Installation of Facility	January1991～January1993	January1991～January1993
Test run of facilities	May1992～November 1993	May1992～November 1993
Final test	June1992～February 1994	June1992～February 1994
Construction of Buildings,	February1994～April 1994	February1994～April 1994
Wiring, and Piping	April 1990～December 1993	April 1990～December 1993
③Project cost		
Foreign currency	4,034 million yen	2,547million
Local currency	5,347million yen	3,668million
(in RMB)	(155.45million RMB)	(1.6747million RMB)
Total	9,381million yen	6,215million yen
ODA Loan Portion	4,034million yen	2,547million yen
Exchange Rate	RMB1=JP¥34.4 (average rate/1988)	RMB1= JP¥21.9(annual average rate /1990~94

Supporting material

Figure: Organization Chart of SHANDONG TELECOMMUNICATIONS CORPORATION Qingdao Branch (as of July 2001)



Source: SHANDONG TELECOMMUNICATIONS CORPORATION Qingdao Branch