CHINA

Lanzhou-Xining-Lahsa Optical Fiber Cable Construction Project

Report Date: September, 2002
Field Survey: July, 2001

1. Project Profile and Japan's ODA Loan

Site Map: Gansu Province・Qinghai Province・Tibet Autonomous Region

Site Picture: Sign of the optical cable at Hainan District , Qinghai Province

1.1 Background

1) Since the adoption of economic reform and liberalization policy in December 1978, China has placed great importance on the development of the telecommunications industry evaluated as one of the essential infrastructures to support its economic growth. Since 1990, especially the digital communications capacity made remarkable growth, e.g. total number of telephone has grown approximately 35% on an annual average basis against the 11% of GNP growth during the same period, which proves rapid development of telecommunications sector in China.
2) The Ninth Five-Year Plan for 1996 ~ 2000 continued to put emphasis on the development of communications network as one of the key foundation of the infrastructure. Above all, a policy with overriding priority for the 1996 ~ 2000 Five-Year Plan was to minimize the gaps between the economically lagged inland regions and the highly industrialized coastal regions, through expanding the transmission channel capacity from the inland to the coastal regions to help accelerate economical development of the poor inland regions. In this context, concerning fiber-optic transmission channel, grid shaped networks were to be formed by laying cables from east to west and from north to south on basis of existing fiber-optic system during the Ninth Five-Year Plan. It was expected, therefore, that realization of this plan would allow 90% of cities to be incorporated into the optical network, and provincial capitals to have multiple crossing optical cable routes, which would give birth to a substantial increase in reliability on and stability of this system.
3) The main territory including Gansu Province, Qinghai Province and Tibet Autonomous Region, which are the targets of this Project, had experienced no development of fiber-optic trunk network, and as a result the network that was to cover all of China had been left uncompleted. Especially for Tibet, completion of such trunk network would have been the first optical cable connected to this region, because there had been no optical trunk passing through the area yet at the time of 1995.

The territory located in the west of China, is the poorest in the country and home to ethnic minority people.However, it is rich in natural resources such as oil, naturalgas, coal and iron, as well as live stocks. It was anticipated, therefore, that the demand for communications would increase rapidly along with the development and industrialization of this region.

The trunk was to connect inland regions of Gansu Province, Qinghai Province and Tibet Autonomous Region. It was also designed to connect between Qinghai/Tibet and coastal regions by linking an optical transmission channel to the existing optical cable trunks that had already reached the Gansu Province at the time of appraisal. The development of optical cable network was strongly needed as an indispensable means to give stimulus to regional economic activities, and was in accordance with the 9th Five-Year Plan focusing on reduction in regionaldisparity.

1.2Objectives

By building a long distance fiber-optic network in western China (Qinghai Province, Gansu Province and Tibet Autonomous Region), they aim not only to cope with the increased demand for telecommunications in these regions, but also to foster the economic growth of the regions through improving the investment environment.

1.3 Project Scope

Yen loan is for whole foreign currency portion needed for the construction of total 2,721km of fiber-optic transmission channel and 13 transmissionsystem.

1.4 Borrower / Executing Agency

Ministry of Foreign Trade and Economic Cooperation, PRC / Ministry of Post and telecommunications, PRC

1.5 Outline of Loan Agreement

Loan Amount Loan Disbursed Amount	3,046 million yen 2,229 million yen
Exchange of Notes Loan Agreement	December,1996 December,1996
Terms and Conditions Interest Rate Repayment Period (Grace Period) Procurement	 2.3% 30 years (Grace Period 10 years), General Untied.
Final Disbursement Date	April,2000

2. Results and Evaluation

2.1 Relevance

1) The objective of this project was to cope with the increased demand for communications in Gansu Province, Qinghai Province and Tibet Autonomous Region through building the fiber-optic long distance transmission network, in order to improve the investment environment and stimulate the economic development and to accelerate the construction of a nation-wide telecommunications network. This has been consistently in conformity with China's development plans and policies up to today since the time of appraisal. Out of the six main items with emphasis on the adjustment of economic structure that were included in China Tenth Five-Year Plan announced in March, 2000, all three items, i.e. "Remarkable improvement in economic growth and level of information society", "Further development of infrastructure" and "Improvement of urbanization level" are related to the improvement of telecommunications infrastructures. Particularly, Chapter 6, paragraph 2 of the Plan clearly states that the first things to do for "the development of information infrastructure" are "to build service centers for information exchange of basic state affairs, public information resources and, macroeconomic, to complete the geographic information system (GIS) and to accelerate the convergence of the three networks of telecom/television/computer (three-network merger)." In

thisregard, the development of telecom infrastructure achieved through this project is assessed as the basic necessity to accomplish the overall goal of building China's information infrastructure.

2) The beneficiaries of this project include not only the residents, governments and private organizations in Tibet, Qinghai and Gansu regions, but also communications users all over the country by the formation of a nation-wide telecommunications network. As described below, comparison of actual results with the estimates for major targets in the Chinese telecom industry proves that all items have far exceeded the targets estimated for 2000 at the time of appraisal, except the long distance switching capacity and that communications users all over the country are enjoying the benefits. From various perspectives including demand aspect, this project can be assessed as relevant.

2.2 Efficiency

2.2.1 Project Scope

The installation of the transmission equipment was completed according to the project plan, but the actual optical cable laid was 18km longer than planned. This was due to adjustments to the route at the Xining ~ Wulan ~ Geermu section in order to cope with the unanticipated geographic conditions.

2.2.2 Implementation Schedule

Tender prcedure for equipment and procurement contract ran a little behind the schedule a little, but final examination was concluded within schedule.

2.2.3 Project Cost

The actual project costs were less than anticipated for both the foreign currency portion and the local currency portion.

The reason may will be because prices of the telecom equipment have came down during the past few years in both international and domestic market.

2.3 Effectiveness

The objective of the project was to develop a fiber-optic long distance transmission network in order to cope with increased communications demand in the three regions. It can be said that the objective has been achieved, seeing that since the completion of the project, significant improvements has been achieved in several indicators such as the switch equipment capacity, number of subscriber lines, telephone traffic and telephone density.

1) Trend of theswitch equipment capacity, subscriber lines andunfilled applications. Table 1 below indicates that all three regions' total capacity of switching equipment and subscriber lines increased more than 100% by the time of completion of this project in 1998 compared with 1995 level. They have further increased from 1998 to 2000 as shown in the table1.

Table 1：Trend of the Switching Equipment Capacity, Subscriber Lines and Unfilled Applications In Three Regions (Actual Results)

		1990	1993	1994	1995	1996	1997	1998 （ Complete	1999	2000
Gansu	Local Switch Capacity (10,000 circuits)	11	N.A.	N.A.	81	N.A.	N.A.	159	185	249
	Long Distance Switch Capacity （ 10,000 circuits ）	0.5	N.A.	N.A.	4	N.A.	N.A.	N.A.	N.A.	7
	Subscriber Lines （ 10,000 circuits ）	9	N.A.	N.A.	43	N.A.	N.A.	95	100	180
	Unfilled Applications （ 10,000 circuits ）	N.A.	N.A.	N.A.	1	N.A.	N.A.	N.A.	N.A.	0
Qinghai	Local Switch Capacity (10,000 circuits)	4	N.A.	N.A.	14	N.A.	N.A.	31	40	48
	Long Distance Switch Capacity （ 10,000 circuits ）	0.3	N.A.	N.A.	1	N.A.	N.A.	N.A.	N.A.	3
	Subscriber Lines （ 10,000 circuits ）	3	N.A.	N.A.	9	N.A.	N.A.	22	28	37
	Unfilled Applications （ 10,000 circuits ）	N.A.	N.A.	N.A.	1	N.A.	N.A.	N.A.	N.A.	0
Tibet	Local Switch Capacity (10,000 circuits)	2	4	4	5	6	9	15	16	16
	Long Distance Switch Capacity （ 10,000 circuits ）	0.02	0.03	0.05	0.1	0.14	0.3	0.5	0.7	2
	Subscriber Lines （ 10,000 circuits ）	1	1	2	3	3	4	6	8	11
	Unfilled Applications （ 10,000 circuits ）	N.A.	N.A.	N.A.	0	N.A.	N.A.	N.A.	N.A.	0
Three Regions Total	Local Switch Capacity (10,000 circuits)	17	N.A.	N.A.	100	N.A.	N.A.	205	241	313
	Long Distance Switch Capacity （ 10,000 circuits ）	0.9	N.A.	N.A.	5	N.A.	N.A.	N.A.	N.A.	12
	Subscriber Lines （ 10,000 circuits ）	13	N.A.	N.A.	55	N.A.	N.A.	123	136	228
	Unfilled Applications （ 10,000 circuits ）	N.A.	N.A.	N.A.	2	N.A.	N.A.	N.A.	N.A.	0

Source：The Statistics Yearbook of each region.

2) Long Distance Traffic

According to the data that were available only for long distance traffic but unavailable for international long distance traffic in these three regions, the total traffic of these three regions grew at approximately 25% per year during the period from 1995 to 2000, and the traffic in 2000 surged three times of that in 1995. Nevertheless, the actual traffic proved to be less than projected in 2000

Table 2：3 Regions Long Distance Telephone Traffic

（ Unit: 10,000 times / year ）

		1993	1994	1995	1996	1997	1998	1999	2000
Gansu	Plan	N.A.	5,510	9,370	N.A.	N.A.	N.A.	N.A.	74,800
	Achievement	3,555	5,641	8,736	11,524	14,490	16,850	20,788	22,671
Qinghai	Plan	N.A.	1,290	2,190	N.A.	N.A.	N.A.	N.A.	17,160
	Achievement	839	1,203	1,924	3,406	4,582	6,104	5,725	7,042
Tibet	Plan	N.A.	280	520	N.A.	N.A.	N.A.	N.A.	3,690
	Achievement	144	229	488	899	1,762	2,204	3,036	3,840
Three Regions Total	Plan	N.A.	7,080	12,080	N.A.	N.A.	N.A.	N.A.	95,650
	Achievement	4,538	7,073	11,148	15,829	20,834	25,158	29,549	33,553

Source：The Statistics Yearbook of each region.

3) Trend of Telephone Density

Excluding Qinghai Province whose data were incomplete, telephone densities of both Gansu Province and Tibet Autonomous Region in 1999 increased drastically compared with those in 1994 and 1995.

Table 3: Telephone Density

(Unit：Set /100 persons)

		1994	1995	1999	2000
Gansu		1.96	2.62	5.27	9.57
Qinghai		2.30	N.A.	N.A.	N.A.
Tibet	City	N.A.	N.A.	25.82	N.A.
	Total Region	1.23	N.A.	4.62	N.A.

Source：The Statistics Yearbook of each region.

Note: Plan and 1996～1998 actual figures were unknown.

The Financial Internal Rate of Return (FIRR)

Since the exact data of revenues and O&M expenses for this project could not be obtained from the implementation organization, China Telecom Group, we calculated the FIRR based on the PCR, using the revenue estimated at the time of the appraisal, O&M expenses amounting to RMB 172.25 million, plus business taxes at 3.3% of the revenue. For the 20 year payback period applied to investment, FIRR was calculated at 12.6%, somewhat higher than the 11.5% estimated at the time of the appraisal, which resulted from an initial investment lower than expected.

2.4 Impact

1) Economic Impact

It is difficult to determine from actual data how this project contributed to the growth of regional ecomomy. For reference purposes, foreign investment and GDP growth of the 3 provinces coverd are below.

1-1)Foreign investment

From the data of Gansu Province and Qinghai Province, except Tibet which has no relevant data (primarily there were almost zero foreign investments), there was an significant upward trend in 2000 as is evident from the table below.

Table 4: Trend of Actual Investments by Foreign Investors

		1995	1996	1997	1998 Complete	1999	2000
Gansu	Direct Investments （ million US$ ）	110	86	107	77	94	123
	Number of Foreign Capital Investments	156	122	62	68	68	76
Qinghai	Direct Investments （ million US$ ）	N.A.	N.A.	53	76	14	122
	Number of Foreign Capital Investments	N.A.	N.A.	22	24	15	42

Source：The Statistics Yearbook of each region.

Note: The direct investments were based on the contract. Tibet was unknown.

1-2) GDP Growth and Industrial & Agricultural Productions

The trend of GDP growth and industrial & agricultural productions in these three regions has shown a trend similar to that of the whole country. That is, the growth rate of each index started to slow down in 1997 and continued to fall until 1999, but turned around again in 2000.

Table 5: Growth of GDP And Industrial & Agricultural Productions For The Nation and Three Regions

(Unit：%)

		1995	1996	1997	1998 Complete	1999	2000
Nation	GDP Growth	9.0	9.8	8.6	7.8	7.1	8.3
	Industrial Production Growth	20.3	16.6	13.1	10.8	11.6	11.9
	Agricultural Production Growth	28.5	10.3	6.3	2.9	0	1.6
Gansu	GDP Growth	9.9	11.5	8.5	9.2	8.3	8.7
	Industrial Production Growth	10.1	10.5	10.3	7.5	8.2	10.2
	Agricultural Production Growth	N.A.	N.A.	0.4	15.9	-1.0	4.9
Qinghai	GDP Growth	N.A.	N.A.	9.0	9.0	8.2	9.0
	Industrial Production Growth			10.5	10.2	9.9	5.6
	Agricultural Production Growth			5.7	4.5	0.2	-2.5
Tibet	GDP Growth			11.3	10.2	9.6	9.4
	Industrial Production Growth			12.2	13.5	8.7	8.1
	Agricultural Production Growth			3.4	2.4	7.5	1.9

Source: “The Statistics Yearbook of China” and the Statistics Yearbook of each region.

2) Status of Telephone Network Development and Improvements in Telecommunications Capacity

Since the completion of this project, there have been significant improvements in the telecommunications infrastructure, and substantial increase in telephone density and subscribers in the whole country. Also, except that the actual long distance switch capacity in 2000 did not achieve the plan target in the appraisal, and there were no plan target for the total length of fiber-optic cable, all other results of major items have far exceeded the plan targets. We believe that this project made contributions to the achievements.

Table 6： Trend of the Telephone Network Development and Improvements in Telecommunications Capacity of the Country (Achievement)

	1994	1995	1996	1997	1998 (Complete)	1999	2000	2001
Total Number of Telephones（ 10,000 set ）	3,959	5,762	7,732	10,111	13,123	17,567	25,607 (12,100)	32,380
Telephone Density （ Set／100 persons ）	3.2	4.7	6.3	8.1	10.5	13.0	20.1 (10)	25.9
City Telephone Density （ set／100 persons ）	13.0	17.0	22.0	26.1	27.7	28.4	39.0 (30～40)	N.A.
Local Switch Capacity （ 10,000 circuits ）	4,926	7,204	9,291	11,269	13,824	15,346	17,826 (15,040)	19,976
Long Distance Switch Capacity（ 10,000 circuits ）	242	352	416	437	449	503	564 (600)	619
Subscriber line （ 10,000 circuits ）	2,730	4,071	5,495	7,031	8,742	10,872	14,483 (8,400)	17,903
Fiber-Optic Cable (10,000 km)	7.3	10.0	13.0	15.1	19.4	24.0	34.1	51.7

Source：JBIC data and “The Statistics Yearbook of China”.

Note: Mobil phones were included in the total number of telephones; plans were shown in brackets.

4) Enviromental and Social Impact

There were no reports with regards to the impact to the environment, issues such as the acquisition of the land, the relocation of local residents, etc.

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2.5 Sustainability

1) The organization responsible for O&M (Operation & Maintenance)

At the time of appraisal, the Ministry of Post & Telecommunications, PRC and the Post & Telecommunications Bureau of the three provinces /region had been presumed to take responsibility for O&M.However, the Ministry of Post & Telecommunications and the Ministry of Electronic Industry were integrated to establish the new Ministry of Information Industry in 1998.

The Ministry of Information Industry has now become the administration agency, while China Telecom Group Inc. has come to act as the substantial implementing organization carrying out the project. The organizations in charge of the O&M were also changed from the Ministry of Post & Telecommunications and the Post & Telecommunications Bureau of the three provinces/ region to the China Telecom Group Inc. and its subsidiaries in these three provinces / region.

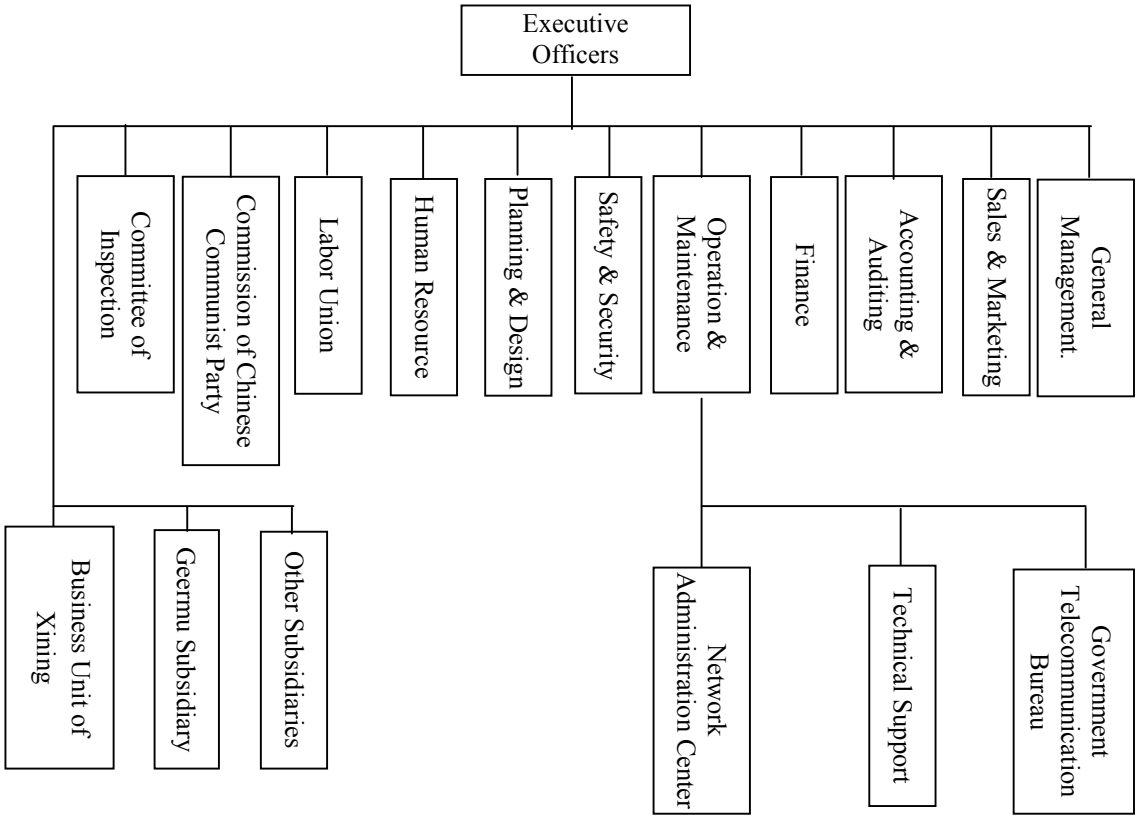
2) Operation and Maintenance

’An outline of operation and maintenance system can be inferred from the organization chart of the Qinghai Telecom Co. which takes responsibility for O&M in the Qinghai Province.

O&M is carried out by the Operation & Maintenance Department of each subsidiary company. The Network Administration Centre and Technical Support Division beneath it carries out specific tasks. Staffing of the O&M Department varies depending on each individual subsidiary. In Qinghai Telecom Co.’s case, for example, approximately 300 technicians and administrative staff are assigned to the department .They cover national first class trunks and provincial second class trunks, including 6,748km fiber-optic cable, one satellite earth station, 800km microwave communications trunk, and 12 automated observation stations. Since the start of services in 1998, nature disasters such as storms, avalanches of rocks and earth, etc., have caused several serious accidents, but the accident rate has not exceeded 1.8 times per year, the target control point of serious accidents.

Consequently, despite still unclear picture remaining about the details of future movement / reorganization of China Telecom, we believe that so long as the operation and maintenance system to date in each subsidiary company continues to be maintained, no concerns regarding the sustainability of this project will exist for the future.

Figure 1: Organization Structure of Qinghai Telecom Co.



3) Financial Status

We have obtained the Profit & Loss Statements and Cash Flow Statements for the China Telecom Group Inc. for the fiscal years of 1999 and 2000.However,they were not available for the Provincial subsidiaries active in the O&M. In such circumstances, we are obliged to decline to represent our assessment on this matter this time.

3. Lessons Learned

None.

4. Recommendations

None.

Comparison of Original and Actual Scope

ITEM	PLAN	ACTUAL
①Project Scope		
(1) Fiber-optic Cable	Total Length 2,721km	Total Length 2,739km
Lanzhou ～Xining ～Geermu Trunk	1,369km	1,338km
Geermu ～Lahsa Trunk	1,186km	1,172km
Wulan ～Delinha Trunk	166km	229km
(2) Transmission System		
Lanzhou ～Xining	STM-16 1 Set	STM-16 1 Set
	STM-4 1 Set	
	STM-1 1 Set	
Xining ～Wulan	STM-4 3 Set	
	STM-1 1 Set	
Wulan ～Lahsa	STM-4 2 Set	
	STM-1 2 Set	
Xining ～Lahsa		STM-4 2 Set
Lanzhou ～Xining ～Wulan		
Lanzhou ～Xining ～Wulan ～ Geermu ～Lahsa	STM-1 1 Set	STM-4 1 Set
	STM-1 2 Set	STM-4 1 Set
Wulan ～Geermu ～Lahsa		
Wulan ～Delinha		STM-1 1 Set
		STM-1 2 Set
②Implementation Schedule		
(1) Fiber-optic Cable		
Bid Contract	October,1996 ～ April,1997	May,1997 ～ November,1997
Manufacturing Transportation	January,1997 ～ July,1997	December,1997 ～ February,1998
Installation	April,1997 ～ September,1997	February,1998 ～August,1998
(2) Relay Transmission System		
Bid Contract		
Manufacturing Transportation	January,1997 ～ December,1997	January,1998 ～ February,1998
Installation	January,1998 ～October,1998	May,1998 ～ September,1998
(3) Network Build		November,1998 ～ February,1999
(4) Project Acceptance Test	October,1996 ～ June,1997	February,1998 ～ August,1998
	December, 1998	
③Project Cost		
Foreign Currency	3,046 million yen	2,229 million yen
Local Currency	6,816million yen	3,899million yen
(Stated At Local Currency)	（ RMB 568 million ）	（ RMB 324.94million ）
Total	9,862million yen	6,128 million yen
ODA Loan Portion	3,046million yen	2,229 million yen
Exchange Rate	RMB1= JP¥12.0	RMB1= JP¥12.0
	（January,1996）	(January, 1996）