Asia China

Jiangxi Jiujiang Thermal Power Plant Project (1) (2)

Contributing to a stable power supply in the Jiangxi Province

【External evaluator】
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Rating

Effectiveness, Impact	a	Overall rating A
Relevance	a	
Efficiency	b	
Sustainability	a	

Project Objectives

To meet the increasing demand for electric power for household, industrial and agricultural use with the construction of a 600 MW-grade thermal power plant (300 MW-grade × 2 lines) using Chinese coal as its fuel as Part III of the Jiujiang Thermal Power Plant, located about five kilometers northeast of the city of Jiujiang in northern Jiangxi Province, thereby contributing to the development of the regional economy.

Outline of the Loan Agreement

- Loan amount / disbursed amount: (I) 12,030 million yen / 11,390 million yen: (II) 17,570 million yen / 14,279 million yen
- Loan agreement: (I) January 1995; (II) November 1995
- Terms and conditions: Interest rate: (I) 2.6%, (II) 2.3%; 30-year repayment period (including a 10-year grace period); general untied
- Final disbursement date: (I) February 2002; (II) December 2005
- Executing agency: China Guodian Corporation
- Website URL: http://www.cgdc.com.cn/web/guest/home

Operation and output performance of the Jiujiang Thermal Power Plant Part III

Indicators		(Unit)	Target figures at the time of completion (Generators No. 5 and 6)	2003		2004		2005		2006	
				Generator No. 5	Generator No. 6	Generator No. 5	Generator No. 6	Generator No. 5	Generator No. 6	Generator No. 5	Generator No. 6
Maximum output		(MW)	300-350 MW x 2 lines	350	350	350	350	350	350	350	350
Net electric energy production		(GWh/year)	4,550	2,260		3,913		3,571		3,889	
Plant load factor		(%)	74.2	45.9	29.4	66.5	69.1	59.6	64.2	63.7	70.6
Availability factor		(%)	74.2	62.8	37.2	91.0	92.0	80.8	83.0	84.2	87.9
Auxiliary power ratio		(%)	6.5	5.7		5.9		5.6		5.5	
Gross thermal efficiency		(%)	41.1	45.8		49.0		46.8		46.7	
Outage hours by cause	Human error	(hrs./year)	N/A	0	0	0	0	0	0	0	0
	Mechanical malfunction	(hrs./year)	N/A	2,102	1,216	13	3	164	3	0	0
	Planned outage	(hrs./year)	N/A	378	427	0	322	725	589	327	0
Outage times by cause	Human error	(hrs./year)	N/A	0	0	0	0	0	0	0	0
	Mechanical malfunction	(hrs./year)	N/A	11	8	2	1	1	3	0	0
	Planned outage	(hrs./year)	N/A	1	1	0	1	1	1	1	0

Source: Jiujiang Thermal Power Plant
Notes: Plant load factor = Volume of annual electric energy production / (rated output × number of hours a year) × 100
Ava lability factor = (Hours of operation a year / number of hours a year) × 100
Auxiliary power ratio = (Volume of electric power consumption within a plant per year / annual electric energy production) × 100
Gross thermal efficiency = (Annual electric energy production × 860) / (annual fuel consumption volume × fuel calorific value) × 100

Effects of Project Implementation (Effectiveness, Impact)

The performance indicators of the plant for 2006 produced mixed results. The actual output was 3,889 GWh against the planned value of 4,550 GWh. The plant load factor stood at 63.7% for Generator No. 1 and 70.6% for Generator No. 2, slightly below the planned value of 74.2%. This was due to the fact that the outage hours for equipment inspection and repairs lasted longer than planned. The plant performed better than the planned values in terms of the auxiliary power ratio (5.5% as against 6.5%) and the gross thermal efficiency (46.7% as against 41.1%).

Between 1999 and 2006, the total power demand and power supply in the Jiangxi Province increased 12.6% and 14.8%, respectively, per year on average. At the time of the ex-post evaluation, the Jiujiang Thermal Power Plant accounted for about 17.5% of the total power supply in the province. Part III of the plant, which was developed under this project, represented 10.0% in 2006 of the total supply, suggesting that the project has made a certain contribution to improving the power supply-demand situation.

Sulfur dioxide emissions from the plant are below China's emission standards thanks to flue gas desulfurization equipment. No adverse effects on the natural environment have been observed.

Therefore, project has largely achieved its objectives and its effectiveness is high.

Relevance

This project has been highly relevant with China's national policies and development plan at the times of both appraisal and ex-post evaluation. At these points in time, power demand exceeded power supply in the Jiangxi Province. This situation is expected to continue as Part IV facility will be constructed at the Jiujiang Thermal Power Plant.

Efficiency

This project cost slightly more than planned (115% of the planned cost). The project also took longer (140% of the planned period), mainly because it took much time to prepare and carry out the bidding due to exchange rate fluctuations and the complicated procedures. Therefore, the evaluation for efficiency is moderate.

Sustainability

No major problems have been observed in the capacity of the executing agency nor its operation and maintenance (O&M) system; therefore, sustainability of this project is high. The agency has adequate technical capabilities to operate and maintain the plant. It has appropriate inspection manuals, as well as systems and facilities for training, research, and technical qualifications.

Conclusion, Lessons Learned, Recommendations

In light of the above, this project is evaluated to be highly satisfactory. A major lesson learned is that any project for constructing a coal fired power plant should be designed to include flue gas desulfurization equipment. It is advisable to change the design of the boiler and coal transportation facilities in a timely manner in order to allow for the use of low-priced, high-sulfur coal, in light of the declining profitability of the Guodian Jiujiang Generating Co., Ltd., which is responsible for the operation and maintenance of the plant under this project.