



Thailand

4 Flue Gas Desulfurization Plant for Mae Moh Power Plant Project (Unit 8-11)

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This project was designed to reduce sulfur oxide (SOx) emissions by installing flue gas desulphurization equipment (95% effective for desulphurization) in the existing Mae Moh Thermal Power Plant located in Lampang Province in northern Thailand, and thereby contribute to the improvement of the environment.

Loan Amount/Disbursed Amount: 15,924 million yen/9,813 million yen

Loan Agreement: September 1993

Terms and Conditions: Interest rate, 3.0%; Repayment period, 25 years (grace period, 7 years); General untied

Final Disbursement Date: July 2001

External Evaluator: Mitsue Mishima, (OPMAC, Ltd.)

Field Survey: July 2003



Evaluation Result

In this project, the flue gas desulphurization equipment was installed almost as planned. The project period was extended considerably beyond the planned date because the executing agency, the Electricity Generating Authority of Thailand (EGAT), was forced to undertake the remaining 40% of work by itself after the contract was cancelled due to the deterioration of the contractor's financial condition. The desulphurization efficiency of generators 8 through 11 at the Mae Moh Power Plant, which was the subject of this project, was 45.7% - 90.0% in 1998, but in 2002 following the completion of the project, it improved to 97.0% - 98.1%. Also, the SOx concentration was 352 - 1,919 ppm in 1998 but improved to 67 - 105 ppm in 2002, reaching a level less than the standard discharge level of 157 ppm. Moreover, since there was no longer any need to limit the power output in order to prevent air pollution, the average operation time of generators 8 through 11 increased from 6,661 hours in 1996 to 7,356 hours in 2002, enabling the plant to generate a stable supply of electric power. In addition, a benefit was also observed wherein the technology for installing and operating the flue gas desulphurization equipment used in this project was subsequently used at other power plants. Regarding the respiratory illnesses of the residents around the power plant (population of

Lampang Province, 410,000; cf. population of Nagasaki, 420,000), it was pointed out that fine particulate matter shows a stronger correlation with such illnesses than SOx, but as a secondary effect of this project, fine particulate matter from generators 8 through 11 was reduced by one-third in 2002 compared to the 1993 level. There are no problems in EGAT's technical capacity or operation and maintenance system, and its financial status is satisfactory. A lesson learned from this project is that, in order to arrange for improvements in residents' health, it is also necessary to consider air pollutants from other sources in addition to SOx in the planning stage.

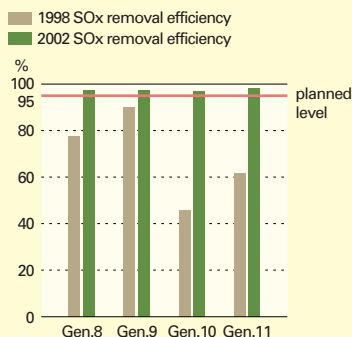
Third-Party Evaluator's Opinion

The installation of flue gas desulfurization equipment has brought a significant drop in SOx emission, and PM₁₀ has also been reduced by one-third of 1993 emission. For clear improvement of residents' health condition, however, one observation points out that the dust from lignite mine operation near the project site which causes PM₁₀ problem will have to be dealt with.

Third-Party Evaluator: Mr. Machima Kunjara Na Ayudhya

Obtained a master's degree in economics from Pittsburgh State University. Presently holds the post of Director of the Board, Krung Thai Bank Public Company Limited, and the post of President, Thailand Development Research Institute (TDRI), specializing in finance.

SOx removal efficiency



The SOx removal efficiency in 1998 was 45.7% - 90.0% in 1998, but this improved to 97.0% - 98.1% in 2002, following the completion of the project.

Sulfur Oxides (SOx)

"Sulfur Oxides" is a general name for all oxides of sulfur which are produced when fossil fuels such as oil and coal are burned. Sulfur oxides cause acid rain since they display strong acidity in combination with water. In Japan, air pollution problems caused by sulfur oxides are declining due to the spread of taller smokestacks, crude oil desulphurization technology, flue gas desulphurization technology, and substitution of fuels such as natural gas. However, sulfur oxides remain a serious problem particularly in developing countries.



Having both domestic and abroad inspection parties to the flue gas desulfurization equipment control room to stimulate the technology.