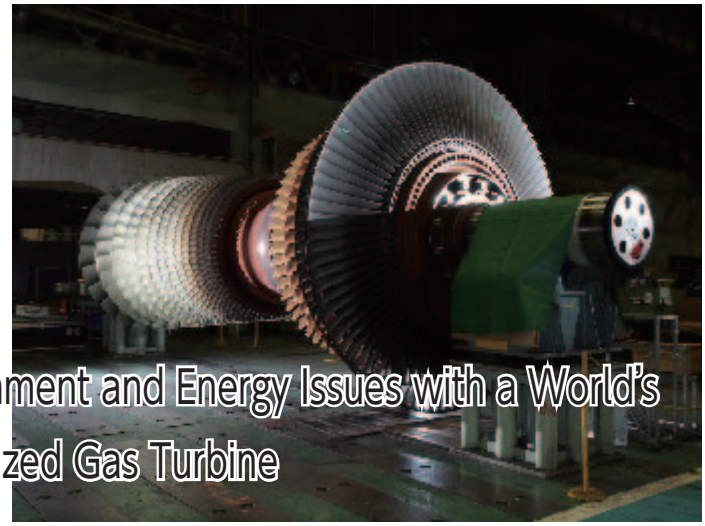
December 2012

Mitsubishi Heavy Industries, Ltd.

・Moonlight Project / Development of High Efficiency Gas Turbine(FY1978-FY1987 / Project of the Ministry of Economy, Trade and Industry),etc.



Contributing to Solve Global Environment and Energy Issues with a World's Highest Level High Efficiency Large Sized Gas Turbine

Ever since the Great East Japan Earthquake that took place on March 11th, 2011, the dependence on thermal powered generation has been increasing. Currently, almost 90% of Japan's demand for electricity is being supplied by thermal powered generation. In midst of this, the "Gas Turbine Combined Cycle Generator System (GTCC)" is gathering attention due to having a high heat efficiency of over 60%, and having almost approximately 50% less exhaust volumes of CO_2 and NOx when compared against coal-fired thermal power. Full-scale development in our country of the large sized gas turbine which is essential to this system dates back to the "Moonlight Project", a national project implemented in 1978. Even after this, performance has been further improved through such as the "New Sunshine Project" implemented under the lead of NEDO. At Mitsubishi Heavy Industries where we have been participating since the time of the Moonlight Project, in the field of large sized gas turbines being led by American and European forces, we have continued to develop large sized gas turbines displaying the world's best performance. For example, the "1,600 ° C Grade Type-J Gas Turbine" introduced in February, 2011 boasts a heat efficiency of over 61%, and is equipped with a high performance film cooling technology developed through the national project. In global shares of large sized gas turbines for generators during the period of January-September of 2012, while Siemens has 38%, Mitsubishi Heavy Industries having 26% is catching up to compete for second place with GE now having 32%. Not only do such gas turbines contribute to Japan's current electricity demand and measures to prevent global warming, they in the future are anticipated to greatly contribute to developing countries where a great increase in the demand for electricity is expected to occur.

Cooling hole of blade

Q. Why did this project start?

Japan relies on the majority of its energy resources on overseas imports, and global fluctuations in the demand for energy have a large impact on social and economic aspects of the country. The second oil crisis in the 1970s in particular highlighted the need for more stable energy supply systems and better energy conversion and usage efficiency. The "Moonlight Project" that began in FY1978 triggered the start of a national project to provide support for the development of high-efficiency gas turbines required for thermal power generation.

Q. What was the aim of the project?

In Europe and America, development of high-efficiency gas turbines had already begun as national policy in the 1970s, in an attempt to become more competitive internationally. In Japan, the gas turbine market was so small at the time that equipment was imported from America. Yet when considering Japan's position in the future, including improving national strength and addressing environmental issues, there lies the need to acquire the technical capabilities to develop gas turbines within Japan as soon as possible. It was with this in mind that a national project was established to develop a high-efficiency gas turbine on par with European and American counterparts.

Q. What is the role of NEDO?

Development of gas turbines involves high risk and large funding, making it difficult for individual companies to embark on such projects. The "Moonlight Project" that began from FY1978 was a project that took on a nationwide scale to develop various types of technologies required for high-efficiency gas turbines. NEDO also followed this up by organizing the "New Sunshine Project" from FY1988 with the aim of achieving even greater efficiency.

From FY2004, the national project "Development of Elemental Technology for High-efficiency Gas Turbines" organized between different government agencies involved industry, government and academia. NEDO continues to support development of elemental technologies through national projects such as these.