Siemens makes history with turbines for Pengerang

by Ng Wai Mun

SIEMENS is expected to deliver the first of four massive power-generating turbine units on schedule, the largest order in Siemens Malaysia's history. This first unit has started its journey by sea from Siemens' German base, via Hamburg, for Pengerang, Johor.

The unit is expected to reach Pengerang by early June. The first turbine, expected to be commercially operational by mid-next year, will also supply power to the national grid for public consumption. The remaining three units are expected to arrive between end-June and July.

In May 2014, Petronas' subsidiary Pengerang Power Sdn Bhd awarded a contract for the engineering, construction and commissioning of its RM5 bil Pengerang co-generation plant (PCP) to a consortium. The consortium comprises Siemens AG, Siemens Malaysia and MMC Engineering Services Sdn Bhd.

The PCP will be one of six associated facilities to be developed within Petronas' Pengerang Integrated Complex (PIC). Other facilities that will be housed in the PIC include the Refinery and Petrochemical Integrated Development (Rapid) project, LNG regasification terminal, air separation unit, raw water supply project. Petronas Chemicals Group Bhd has stated it will pump the bulk of its US$1 bil capital expenditure allocation for this year into the Rapid project.

Technology and expertise

On how Malaysia can further benefit from Siemens' presence in the country, Siemens Malaysia president and CEO Prakash Chandran says the company supports Malaysia with the latest technology and project implementation expertise. "This has been demonstrated time and again in the recent projects where Siemens is involved in here, in particular the Prai Combined Cycle Power Plant and the Pengerang Co-generation Power Plant."

As per the order from Pengerang Power, Siemens is required to undertake the turnkey construction of the PCP, which comprises four power-generating turbine units. Each unit, which can dispatch 400MW of electricity, comes with a Siemens SGT5-8000H gas turbine, a waste-heat recovery steam generator and a steam turbine.

Construction of the PCP is said to require up to 2,000 workers at its peak. On top of providing the four power-generating units, the consortium is also responsible for maintenance and service of the plant.

To get a feel of the weight of the machines, the SGT5-8000H gas turbine weighs as much as one fully-fuelled Airbus A380 plane. In terms of production capacity, the gas turbine produces sufficient energy for the use of about 2.2 million people.

During a test run of its equipment in January, Siemens claimed a new world record where its H-class gas turbine achieved an electrical net output of 603.8MW. This is a new record for a combined cycle plant in a single-shaft configuration. This output also means a net power-generating efficiency of 61.5%, enabling Siemens to beat its own efficiency record of 60.75% set in May 2011.

Prakash says: "As energy consumption continues to increase, efficient power generation will be a vital component of reliable energy systems. Each country must be able to develop a reliable energy mix which accommodates this [consumption] growth.

Siemens is doing its part to protect the environment. Compared to the average emissions of coal-fired power plants in Europe, a gas-fired power plant similar to the one produced by Siemens, with an electrical efficiency of 61.5%, in theory, saves about 2.5 million tonnes of carbon dioxide annually. This is equivalent to the carbon dioxide emitted by over 1.2 million cars, each driven 15,000km a year.

The Pengerang Integrated Complex is part of the Pengerang Integrated Petroleum Complex (PIPC). The PIPC is located on a single plot measuring about 8,100ha. The complex will house mainly oil refineries, petrochemical plants and liquefied natural gas terminals.