



Smooth operator

Malaysia LNG enhances production through improved energy efficiency

Malaysia is home to the world's largest liquefied natural gas (LNG) production facility in a single location. Its operator, Malaysia LNG, keen to maintain the complex's status as a world-class facility, embarked on a project in 2005 to review and improve energy usage. Aware that reducing energy consumption could help improve operating performance while minimising environmental impact, Malaysia LNG teamed up with Shell Global Solutions to develop and implement an energy-efficiency programme.

The scope of the project included two of the complex's three LNG production facilities: Satu, which is steam-turbine-driven; and Dua, which is gas-turbine-driven with steam-driven helper turbines.

At the start of the project, we established a team of our consultants and Malaysia LNG operational staff to work together to identify potential energy-saving activities. One area of interest was the plant's steam systems. An extensive review of the steam systems' operating conditions revealed that the performance of steam-consuming equipment could be improved through fairly modest adjustments.

Another area of interest was the controlled release of hydrocarbon-containing streams to an incinerator or a flare system. The energy-efficiency programme included measures to reduce and stabilise the hydrocarbon content of the sour gas released to the incinerators. This enabled the incinerators' operation to be optimised and the overall fuel use to be reduced.

An LNG plant meets its energy needs from its own feed gas. Two different operating modes can occur. If feed-gas availability exceeds the plant capacity, then this capacity determines the volume of LNG production, and the plant is capacity constrained.

Alternatively, if the plant capacity exceeds the feed-gas supply, for example, in the case of scheduled upstream maintenance, then feed-gas availability determines the LNG production volume, and the plant is feed constrained.

During capacity-constrained operation, increasing the energy efficiency reveals opportunities to increase the plant capacity. During feed-constrained operation, saving energy increases the amount of feed gas available for LNG production. In both cases, improving the energy efficiency of the plant has resulted in increased LNG production. Consequently, Malaysia LNG expects an overall LNG production increase of up to 1%. The improvements have been made with minimal capital expenditure.

Shell Global Solutions' tailored energy-efficiency programme was originally designed for refineries; this was its first implementation at an LNG complex. The programme can be used across a wide range of industries and is particularly appropriate for energy-intensive businesses.

"The team performing the investigation consisted of staff 'borrowed' from our day-to-day operations and Shell Global Solutions' consultants. This combination of a thorough knowledge of the plant and an objective view from outside enabled us to identify, realise and sustain substantial energy savings and to increase revenues from the plant. The programme further provided valuable input and inspiration for upgrading and fine-tuning our own energy-management system," says Halim Che Abas, senior manager, technical services, Malaysia LNG Sdn Bhd.

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