FLEXIBLE OPERATION with Valmet DNA

The Dangjin Biomass Power Plant near Seoul in South Korea is the largest biomass power plant in Asia and started operations in August 2015. It uses a mix of agricultural and associated by-products. The plant generates 105 MW of electricity and the demanding process is run with Valmet's latest automation technology – Valmet DNA distributed control system. TEXT Soili Städter

The Dangjin power plant site is operated by GS EPS. The site consists of three other power plants that are fired by liquefied natural gas: combined-cycle power plants 1–3. The aim of the new biomass power plant is to enhance the company's competitiveness in the power market, increase its electricity capacity and produce more renewable energy. "We have chosen Valmet's automation system because the company has many references from demanding, biomass-fired power plants. It also fulfilled our technical support requirements," says **Gye Man Jeong**, General Manager of GS EPS.

The plant is fueled with a mix consisting of 80% palm kernel shells and 20% coal. With Valmet's advanced automation applications, it is possible to control even these difficult fuel mixes with varying fuel ratios.

Automation system covers the whole plant

The Valmet DNA automation system is in use for the whole biopower plant, including the circulating fluidized bed boiler, balance of plant equipment, fuel handling system and electrical network. The plant has one main control room and another for the fuel field.

JeongHo Ahn, Maintenance Manager, explains that the use of biomass is very important for the company and its sustainability progress. GS EPS has launched a broad energy management program where the greenhouse gas emission level assessment and measures to reduce emissions, for instance, play a key role.

JeongHo Ahn is able to monitor the environmental values through the automation system. He is very familiar with the plant's automation solution.

The main control room is run by five operators who work daily with Valmet DNA. Initially, the technical descriptions in the user interface were used regularly. Now that the operators have learned the features of the automation technology, they are no longer used so frequently – but they are certainly useful for training new operators.

Flexible operation means a smooth process

DNA Operate is the operator interface of the automation system and is executed in the operator stations. DNA Operate is used for all operations and monitoring, including graphical process control displays, event and alarm displays, loop windows and interlocking windows, among others. For users, it is important to know what has happened in the process and the underlying reasons.

The history can be easily seen and analyzed, which JeongHo Ahn emphasizes. "The history replay feature makes follow-up easy. We can also learn the root causes of disturbances and alarms, which is essential when

HAPPY OPERATORS
GiHeung Kwon, Lead Engineer from Valmet and JeongHo Ahn, Maintenance Manager (on the left) with the local operators Hwoechul Jung, Eunho Cha and Deokchul Jung.

running the process. Drag-and-drop trend analysis means that the timeline can be presented visually. The visual elements are quick and more informative to look at," he explains.

User-friendly tool for operators

"The more user-friendly the automation system, the better the operators can utilize it. For me, it is most important that the heavy users – the operators – can make good use of the automation system. The initial training from Valmet's experts was a good start to learning the process. Then you can learn more by doing," states JeongHo Ahn.

First thing every morning, JeongHo Ahn checks what happened during the night shift. For him, it is important to analyze the alarms to further develop the process.

Information is power

Information from Valmet's monitoring and reporting applications is regularly used by the management. Many parameters can be followed, such as the fuel data and performance of the power plant and steam turbine. Real-time reporting is based on concrete measurements.

Valmet's heat exchanger performance monitoring provides the plant's maintenance personnel with a powerful tool for detecting problems and deviations in the heat balance. Furthermore, the thermal stress monitoring lets the personnel follow the heat situation, which contributes to the economical operation of the boiler. In power generation, as in many other industries, correct information at the right time clearly contributes to the success of the business.

A biomass plant with attitude

Now the automation project is completed successfully and JeongHo Ahn remembers the project phases with satisfaction. The planning phase was completed professionally; the installation and start-up were executed ahead of schedule. Throughout the project, information was shared openly between the customer and Valmet.

Now that Asia's largest biomass power plant is fully in operation the plant management can be proud of its achievement. ■

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