



INTRODUCING TRIGENERATION IN CHEONG SOO

In May 2007, Wärtsilä was awarded a contract from JB Enertek Co., Ltd., South Korea, to deliver engineering and equipment (EEQ) in two phases for a 25.3 MW_e combined heat and power plant (CHP). The plant is located in Cheong Soo community in Cheon Ahn City, approximately 100 kilometres south of Seoul, Korea.

The purpose of the Cheong Soo trigeneration plant is to provide district heating and electricity to a suburban area covering approximately three

square kilometres with about 6400 households and public buildings. The first phase of the project comprised two Wärtsilä 20V34SG natural gas-fuelled generating sets equipped with a heat recovery system for district heating purposes. Phase 1 was commissioned and handed over in February 2010. The second phase consists of an identical genset to the previous and is scheduled to be completed in 2015. The three gensets generate electricity in parallel with the

electrical grid and supply district heating to the town network. During the warm summer periods the plant provides district cooling as well.

Due to tariff policy in South Korea, selling only electrical power to the grid is not feasible. At night, the electrical load in the suburban area is so low that the amount of heat generated by the engines at this time is significantly reduced compared to daytime. Unfortunately, the amount of heat needed by households during this

” Cheong Soo CHP is most successful engine plant in South Korea and we are very proud to supply power and heat to our customer by using Wärtsilä 20V34SG engines.”

*Mr. DP Lee, Gas Equipment 1 Team,
Sales Manager, JB Enertek Co., Ltd.*

| THE CHALLENGE | WÄRTSILÄ'S SOLUTION | BENEFIT |
|---|---|---|
| Electrical load minimal but heat demand maximum at night | Charging of heat accumulators during daytime and consumption of heat at night | Minimum 85% efficiency 24 hours a day |
| Electricity generation parallel to the grid | Wärtsilä 34SG gensets provide continuous and reliable energy | Avoiding the costs of installing external site connections |
| Meeting the noise level and emission requirements set by Korean legislation | Advanced emissions and noise reduction equipment were installed | Compliance with regulations allows plant to operate efficiently and avoid potential penalties |

period of time in the 24-hour cycle is at its maximum. This is why installing a heat accumulator comes into question: it allows the Cheong Soo plant – operating essentially in island mode – to run continuously on high load and thus, at high levels of total efficiency (more than 85% in this case). The additional heat generated during day-time is partly stored in the accumulator for use during the following night.

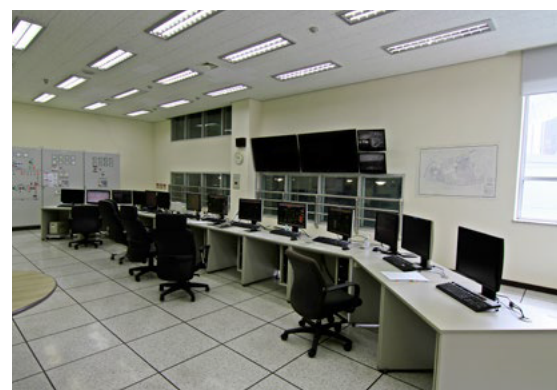
This was the first CHP project delivered by Wärtsilä in South Korea under the CES (Community Energy System) concept which is based

Cheong Soo power plant is the first CHP project delivered by Wärtsilä in South Korea under new CES concept.

on South Korean legislation to encourage decentralized energy production. The objective of the CES concept is to supply electricity and heat from independent power production facilities to

commercial, residential, business and hospital buildings in specific areas.

After the completion of the second phase, the total electrical output of the plant will be raised to 25 MW_e and thermal output to 21 MW_{th}. Wärtsilä designs, procures and delivers the equipment as well as provides technical advisory services at site during the installation and commissioning works. The erection and installation of the equipment is carried out by JB Enertek and local contractors.



MAIN DATA

| | |
|---------------------|---|
| Customer | JB Enertek Co., Ltd (IPP) |
| Type..... | Wärtsilä 34SG gas trigeneration power plant |
| Operating mode..... | Flexible baseload |
| Gensets..... | 2 x Wärtsilä 20V34SG & 1 x Wärtsilä 20V34SG |
| Total output | 25 MW _e + 21 MW _{th} |
| Fuel..... | Natural gas |
| Scope..... | EEQ (Engineered Equipment Delivery) |
| Delivered | 2010 & 2015 |