Proving technological and executional competence - Siemens H-Class projects in the European power market

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Over the last couple of years the Siemens H-Class technology has gained more importance in the electricity market of developed countries where efficiency and operating flexibility are the key topics for economic operation of the CCPP fleet. Siemens has sold 46 units until now, and after successful completion of several 60 Hz H-Class plants in South Korea and the US, further installations for the 50 Hz units are currently underway in Turkey and Germany.

These projects and plants display the wide range of Siemens’ technological and executional competence, since Siemens offers an unparalleled range of scope splits and technological and executional concepts matching the individual customer needs. Siemens supplied a so called Power Block for the Samsun 600 MW CCPP in Turkey with high operational flexibility to meet the requirements of the constantly evolving Turkish market. On the other hand the Lausward CCPP “Block Fortuna” in Germany has been built with full EPC responsibility by Siemens with a strong focus on optimized Combined Heat and Power (CHP) capabilities.

In retrospect and after the successful conclusion of the Ulrich Hartmann plant in Irsching, Germany and the related validation and testing phases, Siemens is the first OEM to hand over a gas turbine engine and a CCPP with efficiency far beyond 60%. Siemens has shown that record-breaking technology is now commercially available to customers worldwide.

The first commercial success was achieved in Florida, USA where nine SGT6-8000H units were placed. All Florida Power & Light sites in Cape Canaveral, Riviera Beach (these six engines are already in commercial operation) and Port Everglades are equipped with the SGT6-8000H gas turbines in a multi-shaft configuration (three on one) and each provides approximately 1,200MW of electricity.

Prior to shipment at Cape Canaveral the full-scale 60Hz engine was thoroughly examined at the Siemens gas turbine manufacturing plant in Berlin. During this time, an order from South Korea for a complete CCPP equipped with the SGT6-8000H in a single-shaft configuration was placed by the IPP GS Electric Power and Services. As a consortium leader, Siemens installed the 400MW power plant, Dangjin 3 on a turnkey basis which was marked as the first plant in Asia exceeding 60% efficiency.

In 2012 and 2013 further seven units were successfully sold in South Korea, with Ansan as a multi-shaft configuration, Andong, Posco Power 2 as a single-shaft arrangement and Daegu City as a single-shaft with a CHP application.

Following the success in South Korea, further contract awards were achieved for two CCPPs in the USA, one in the Philippines as well as two in Malaysia respectively.

The biggest order for the European Market was the Lausward CCPP with district heat extraction in Düsseldorf, Germany.

After the Samsun project which is already in commercial operation, Siemens has received in 2014 the second order for the turnkey construction of the Bandirma II CCPP in Turkey. This will be the first H-Class plant with an ACC main cooling. The purchaser is Enerjisa, a joint venture of Sabanci Holding and E.ON.

On December 2, 2014, Siemens concluded a contract with the customer PKN Orlen, Eastern Europe’s largest mineral oil company for turnkey erection of Plock CCPP in Poland.

The latest order is Hamitabat in Turkey. Siemens is supplying two SGT5-8000H gas turbines, steam turbines and generators along with the I&C system to Turkey. These components are to be installed in two combined cycle power plants in Hamitabat. Together they will have an installed power generating capacity of 1200 MW. Customer is GAMA Power Systems
Engineering and Contracting Inc. The end customer and operator of the plant is the independent power producer Hamitabat Elektrik Üretim ve Ticaret A.S.

The fleet of the Siemens H-Class world-record gas turbines achieved a cumulative 170,000 equivalent operating hours (EOH) in May 2015. More than 46 of the H-Class gas turbines have been sold worldwide; sixteen are currently in successful commercial operation with a high degree of starting reliability and availability. Several projects are also in final negotiation which showcases the global acceptance and customer trust in Siemens power plant solutions.

Furthermore this presentation gives an insight of the successful track record and in the technological features of the plants to meet the different market requirements. In addition the different contractual models for a full turnkey and for a limited scope of supply combined with erection and commissioning services are illustrated.

Figure 1: H-Class world wide references
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