

Heat Recovery Steam Generator (HRSG) and Balance of Plant Support (BOP) for Saudi Arabia

The MAVERICK team provided commissioning and DCS support for HRSG and balance of plant operations in the Middle East.

Objective

MAVERICK was contracted to support the commissioning and startup of a new GE installation in Saudi Arabia for the first Integrated Independent Water and Power Project (IWPP) in Saudi Arabia, producing 2800 MW and 210 MGD of water in Jubail City, Saudi Arabia.

Results

The MAVERICK team led the controls commissioning and startup for the power blocks and also provided technical support for the water block. The successful project was the world's single largest utility and first IWPP in Saudi Arabia.

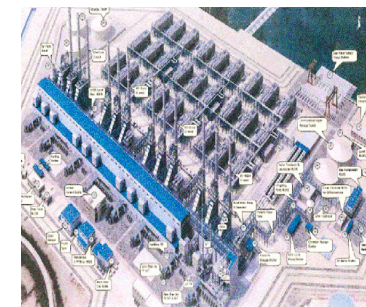
Solution

This was the world's single largest utility encompassing 35,000 I/O points. It provides 10% of the power and 20% of the fresh water to Saudi Arabia.

MAVERICK performed on-site engineering and modifications to the control software for the HRSG systems to improve the operation and performance. With a four-person team and two engineers-in-training (EITs), the team also supported the development of software patches and system upgrades along with daily commissioning and startup activities with multiple power blocks being commissioned in parallel. The team developed and implemented a strong software modification process to allow for management of change to ensure all units were using the same code.

The plant was configured in a three gas turbine with one steam turbine power block configuration with a common feedwater system. Three blocks were then interconnected on the steam and condensate sides to provide the most flexibility to operations. This provided a challenge to maintain a balance between the water demands and steam production of each power block.

MAVERICK's experts designed and implemented a new control philosophy to balance the level of the deaeration tanks and the water flow to each block along with the steam production from each block.



This was the first plant to be commissioned using Version 3.6 of the GE Mark VIe control system. The MAVERICK team's in-depth knowledge and close working relationship with the software development team allowed them to accomplish a complete system upgrade with only an eight hour plant shutdown.

The steam turbines were a new application for GE using a non-condensing HP turbine to provide low pressure steam to the desalination portion of the plant with the desalination units acting as the condenser for the power blocks. This provided a unique opportunity for the team to draw on their extensive experience in combined cycle operations to utilize Duct Burners to regulate the HP pressure to maintain the LP header to the desalination plants, with a plant master control operating the duct burners on each of the nine units.

During startup, the team tuned the water and steam systems for optimum performance and stability, which provided a higher than guaranteed performance for the customer.

With continued support, MAVERICK has developed a communication link between the customer and their gas supplier to monitor gas conditions at the main gas line 12 km away to provide an advanced warning of changes in the gas composition that may impact plant operations.

The MAVERICK Difference

The direct working relationship between the field teams and the engineering teams made it easier to make corrections and facilitated quick and accurate solutions.



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