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**Project: To Convert Rocksavage Power Station
From A Base Load Station To A Flexible Station**

“Can we modify the existing installation from a base load unit into a flexible unit, capable of reacting quickly to on demand changes of the grid, including starting and stopping daily?”

ROCKSAVAGE POWER STATION, RUNCORN, UK

Rocksavage Power station, owned by InterGen, was built in the late nineties to provide the steam and electricity supply for the nearby chemical complex.

The installation was based on two Alstom GT 26 gas turbines, two Alstom triple pressure waste heat boilers and a steam turbine.

Because the installation was designed and built as a base load unit the flexibility to start and stop the installation was very limited.

One bypass system installed between the HP main steam and the condenser was used to start the boilers in sequence, one after another.

For a flexible starting and stopping regime the time to get on line was simply far too long.

InterGen was interested to modify the installation, to make it more flexible and to get the installation fit for a quick start and stop regime to supply electricity to the public grid, without reducing reliability.

Advanced Valve Solutions UK Ltd was involved in the discussions to modify the plant.

A few issues had to be addressed:

First of all was the need to protect the reheat super heater for too high temperature increases during the start up of the installation.

In the old regime starting three times a year, the IP super heater could rely on produced IP steam for cooling. In the new, flexible, regime during start up the re-heat super heater modules would get too hot before sufficient IP steam is produced.

Doing this every day would lead to severe damage in the super heater modules and headers. The materials would deteriorate quickly due to the applied temperatures and pressures being too high.

This would lead to considerable replacement costs and unacceptable down times. How soon the damage should occur would be unpredictable, but it could happen sooner than expected.

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CASCADE ARRANGEMENT

The modification comprised the installation of a cascade arrangement per boiler, based on an HP bypass and an IP dump valve.

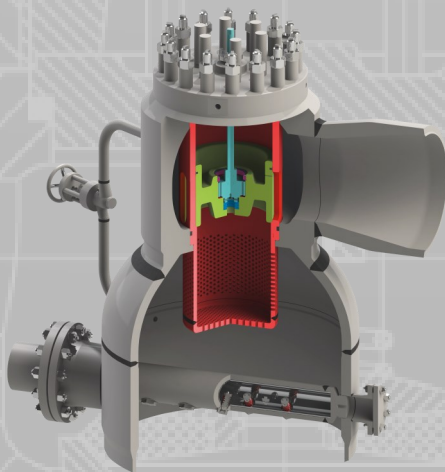
Per boiler an HP bypass valve, a PRDS and a control valve, that reduces pressure and temperature, was placed between the main steam line and the cold reheat line. During start up, steam, now coming from the PRDS instead of the steam turbine is introduced in the re-heater to take care of cooling the modules. This is a severe mass flow, mixed up with additional steam coming from the starting IP evaporator.

In the next step, hot steam, coming out of the IP re-heater is now “dumped” into the condenser through an IP dump valve. The combination HP - IP bypass valves per boiler makes it possible to start both boilers simultaneously. A quick start of the whole installation now is possible.

ADVANTAGES

- Significant reduction of startup time
- The possibility of heating up the boilers equally and smoothly and consequently minimizing material stress in super heaters and headers
- Extend the life cycle of the boilers significantly

The significant reduction of startup time will make the installation more attractive to supply to the grid and will save considerable amounts of money.





Advanced Valve Solutions UK Ltd advised in the selection of the PRDS valves, an additional TAL valve and the injection water control valves.

AVS UK involved **Stork Thermoq BV** for plant lay out and pipe routing, the acoustic insulation and performance calculations and the design of the logics, which were implemented in the DCS.

Rocksavage Power Company were responsible for overall project management.

More costs savings in the future can be expected from the installation of HORA cooled de-superheaters and multi cascade OTC valves and Persta thin walled forged main steam valves, hot reheat shut off valves and a further optimization of the drain

Advanced Valve Solutions (AVS) has replaced many critical valves in UK power stations and has a proven track record in protecting stations from loss of production and saving £000,000s in repairs and replacement parts.

Call us on 0161 242 1355 to find out more about how we could help you.

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