SUPERCRITICAL POWER PLANT
CONDENSER LEVEL CONTROL

Supercritical and Ultra-Supercritical plants are a vital part of global power generation. They operate above the critical pressure and temperature of water (3206.2 psia at 705°F), up to a maximum of 4350 psia and 1170°F. Since feed water is turned into steam as it travels through the boiler tubes, the startup system requires problem-free operation.

One of the most important parts of a power plant is the condenser. Drawn into the condenser, the steam is "condensed" back into water so it can be used repeatedly within the plant. Plants need reliable actuation to efficiently control the condenser application process and maintain maximum MW output.

A supercritical coal-fired power plant in South Africa experienced control issues with their condenser level control valve. The installed pneumatic piston-type actuator could not properly control the valve due to a combination of process parameter changes, compressibility of air and valve static friction. Its erratic hunting for position and the

ELECTRAULIC™ ACTUATION

ensuing water hammer resulted in the breakage of downstream pipework hangers and welds of the pipework leading into the feedwater deaerator. Consequently, this meant the whole generating unit needed to come offline and be drained for the pipework to be welded – sometimes taking more than 12 hours to repair. This lengthy downtime, as well as a significant loss in revenue and availability of MW output proved disastrous.

To combat these continuous issues, plant operators worked with REXA to size and custom engineer an Electraulic™ actuator to fit on top of the existing control valve. Our actuator's incompressibility of oil, solid-state electronics and superior control performance eliminated the poor control and associated water hammer. Upon installation, plant operators noticed an almost immediate improvement in the stability of the condenser level with additional improvements in other feedwater equipment (LP heaters, flashbox, etc.).

BEFORE

AFTER

AFTER