

Power Station Chooses Ultrasonic Technology For Reliable Level Control

RESULTS

- Significantly reduced maintenance
- Potentially dangerous incidents are avoided



“The instruments have given no problems since installation - they operate perfectly”

Instrument Technician

APPLICATION

Acid and caustic measurement in boiler feed water treatment plant at a coal fired power station

CUSTOMER

A UK power station

CHALLENGE

In any large steam generating system, the quality of the water used to feed the steam generation boilers is critical to the efficient operation of the plant. All impurities must be removed to minimise problems such as corrosion, scaling and sludge formation. At the 4,000MW Power Generation site – Western Europe’s largest coal-fired power station – water is drawn from a local borehole and subjected to a three-stage de-ionisation process to remove dissolved minerals. The process requires regular regeneration using concentrated solutions of sulphuric acid and caustic soda.

The 98% acid and 47% caustic solutions are held in five bulk storage tanks: four hold approximately 50t and the fifth is capable of storing 148t of acid; the tanks are replenished as necessary from 25t road tankers. The level in each tank is constantly monitored to ensure that it is never completely drained - if sludge from the bottom of the tank reached the ion-exchange beds a costly de-contamination operation would have to be carried out. When a tank is refilled it must have sufficient capacity to accept a full 25t load: part loads are uneconomical and spillage unacceptable.

SOLUTION

Refurbishment of the water treatment plant provided the opportunity to replace the existing level measurement systems. These were based on hydrostatic pressure sensors immersed in the liquid and were causing concern because the seals were prone to attack by the aggressive concentrations of acid and caustic soda. In addition, the high and low alarm level switches had become corroded beyond use.

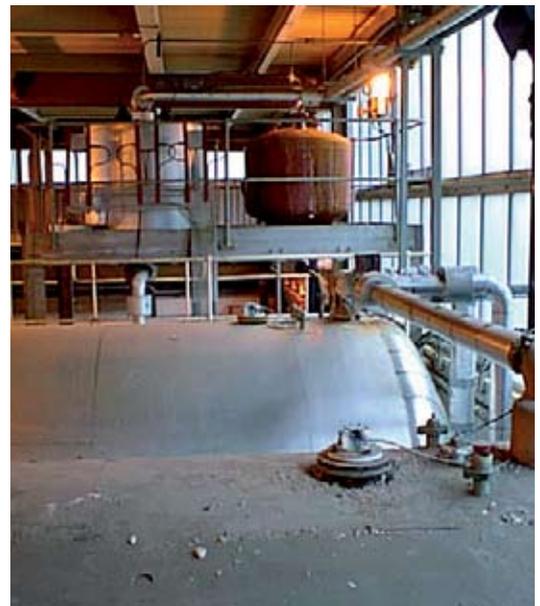


Figure 1 Transmitter installation

POWER

SOLUTION (continued)

Rosemount® model 3102 ultrasonic liquid level transmitters were selected as a replacement for continuous level measurement. PVDF faced sensors were selected for their resistance to chemical corrosion and the sensors are mounted at the top of each tank, eliminating any direct contact with the tank's contents.

The output from the 3102 is connected directly to a local display at the filling point showing the contents of each tank (in tonnes) and this is also relayed to the water treatment control room. The 3102's integral relay outputs are programmed to trigger an audible alarm if a pre-set level in the tank is exceeded, eliminating the possibility of overfill and spillage. This is a particular requirement at the tank filling point where the safety of the operators is paramount.

Tests have shown that the level measurement is well within the accuracy required for the application.

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