

Lindsey Oil Refinery Fulfills Safety Requirements and Reduces Risk of Unplanned Shutdown with Fault Tolerant System

RESULTS

- Fulfilled safety requirements
- Reduced risk of unplanned shutdown
- Decreased maintenance costs



APPLICATION

Boiler drum water level monitoring

CUSTOMER

Lindsey Oil Refinery, Humber Estuary, U.K.

CHALLENGE

Lindsey Oil Refinery wanted to improve the reliability of their steam generation system.

This site uses various processes to refine crude oil into lighter fractions. The lower fraction products are extremely viscous, so in order to keep product in liquid state, the pipes are heated and insulated. Steam generation is essential to the process of heating pipes. The raising of this steam is carried out by a number of oil fired and waste heat boilers on site, the main one being a 600 kg/hr boiler situated in the catalytic cracking area of the plant. Historically, the boiler drum water level was measured with a front and back end gauge glass system giving a local visual indication of water level. Due to the purity of the water used to raise steam, the gauge glass would erode giving poor visibility, or in some instances, zero visibility along the column. The water level in the drum would frequently drop below the gauge glass window giving the impression of an empty drum thereby causing false alarms. Lastly, the seals between the gauge glass and boiler were weak which lead to steam leakage.

Unreliable level measurements in the boiler drums were costly and risky to the refinery. Leaky seals in the gauge glass system resulted in high maintenance costs. Loss of indication or control risked safety and unplanned outage. This refinery needed a more reliable, fault tolerant system.

No single fault will cause a system failure due to a dual redundant design.



Figure 1: Hydrastep installation

SOLUTION

To solve these issues, Lindsey Oil Refinery installed a 2468 Hydrastep Electronic Gauging System. This system takes measurements from two 24-port water columns fitted to either end of the boiler drum, connected to two separate electronic gauge systems. Using high brightness LEDs, the Hydrastep offers clear indication of water level. Its dual redundancy design ensures that no single fault will cause system failure. Additionally, diagnostic circuits test both short and open circuit conditions and provide fault indication. The Hydrastep's fault tolerant design addressed safety requirements and took the place of the gauge glass.




Lindsey Oil Refinery is pleased with the 2468 Hydrastep System. The fault tolerant design of the Hydrastep continues to operate even if the circuit fails, thereby fulfilling their safety requirements and reducing risk of unplanned shutdown. The diagnostic circuits make a test switch unnecessary and reduces maintenance costs.

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Delta Mobrey Limited

Riverside Business Park, Dogflud Way
Farnham, Surrey, GU9 7SS, UK

 +44 (0)1252 729 140
 +44(0)1252 729 168
 sales@delta-mobrey.com

