

## ***AMETEK Drexelbrook® RF Technology Solves “Over – Boil” problems in the Brewing Industry***

### **A Major North American Brewery discovers a solution to Kettle Over-Boil that has several monetary benefits to plant operations.**

Under older plant operating guidelines, kettles constantly over boiled. A kettle over-boil situation could occur as many as 30 times in a typical life cycle from filling to knockout. When an over boil situation occurs, the steam exhaust valve would shut immediately. This is done to avoid a massive product loss situation and also to protect plant personnel in the immediate area from this dangerous process upset situation.

The down-stream effect of having the exhaust valve slam shut, during an over-boil event, is dramatic on the demand for steam from the utilities department. The steam demand for brewing can swing as much as 40,000 to 80,000 lbs. during this event. Swing demands of this magnitude could easily pull a boiler off-line.

#### **Utility Department Issues:**

Aside from preventing an undesired over-boil situation and a dangerous environment to personnel in the immediate area, this solution also has several benefits to the utility department with issues related to steam demand swings.

- Boiler draft problems occur when rapid load changes occur due to excessive steam demands. Boiler controls react by increasing fuel and air supply to meet this new demand. If equilibrium cannot be established, the boilers can trip off-line due to positive or negative drafts.
- Boiler trip on low water level can occur when the steam load suddenly drops. The feed water and the steam valve work together and as the demand for steam drops, the feed water valve starts to close. This could cause the boiler to trip off-line due to low water level.
- A rapid swing in steam loads increases the coal feed speeds. This can lead to inefficiency in the combustion process. The excessive increased amounts of coal will not burn efficiently, producing more ash with higher carbon content.

#### **The Solution:**

AMETEK-Drexelbrook successfully provided an RF level technology solution that allows plant operations to control the kettle boil without damaging quality and manage the swing demands for steam by preventing an over-boil situation.

Drexelbrook's solution is to provide a continuous level measurement that generates a signal proportional to the amount of foam on the RF sensor that is generated during the boil process. Past methods used a "presence or absence" (point level) instrument to detect when foam was at the over-boil stage. The continuous proportional signal is used as one input to the logic controller to modulate the amount of steam that is used during the boil. The logic program works to keep the temperature at boil while gradually cutting back on the steam, avoiding over-boils and drastic steam demand swings.

The Drexelbrook continuous RF system is comprised of a standard RF transmitter and an RF foam sensor that is long enough to cover the anticipated range of foam in the kettle during boil. RF technology was proven to provide the best reliability and repeatability in this measurement.

A Drexelbrook RF Admittance system (Model 509-75-Series) was the base for this measurement of foam level. The Admittance technology allows accurate, repeatable and reliable performance in the face of any coatings that may be deposited on the sensor from the foam. Foam sensors are fully Teflon coated and are available in 3A and sanitary designs with NPT, Flange or Triclover fittings for mounting on the kettle. RF Admittance Technology is immune to coating build-up, variations in product density and temperature, or pressure changes, while maintaining the sensitivity required for foam measurement.

**Reference:**

Master Brewers Association of the Americas – Volume 38, Number 1, 2001, Pages 37 – 40. Kettle Boil and 170° Water Control Project. By Lee Hodge-Muse and R. Moore.

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