

SMART TECHNOLOGY IS ALIVE

IN CONDUCTIVITY TYPE BOILER DRUM WATER LEVEL SYSTEMS

BY JIM KOLBUS

Over the past 50 years, conductivity probe type level indication systems have become an industry standard for the continuous display of boiler water levels in control rooms around the world. Operators appreciate the reliable independent level indicator, which some users compare to a “traffic light” for monitoring the water level, among all the other plant controls that are monitored in the control room. As soon as the level indication deviates from normal water level, it gets the attention from the operator (Figure 1).

These conductivity type level indication systems often serve the functions of a remote (indirect) drum level indicator and often as an alarm or trip device. Users trust the conductivity probe technology because it is simply based on whether the

in their boiler drum with operating pressures ranging up to 3,000 psi (206 Bar). Users must also meet the Boiler Code requirements for two independent level indication systems on continuous display for the operator, which applies when the level in a water gage glass is not directly visible to the operator. This trusted technology is often used along with other level transmitters to improve plant reliability and safety.

Smart technology is now available in these systems exclusively from Clark-Reliance, which provides the operator with more informational features than ever. The SmartLevel Eye-Hye Drum Level Indication system from Clark-Reliance provides blowdown indication, which alerts the operator when it is time to conduct a blowdown on the column containing the conductivity probes by illuminating a blue warning light on the remote panel indicator. This intelligent system alerts the operator when a steady degraded condition of the probes is detected, but warns the operator before a false level indication occurs. This blue light is activated only when this state of probe condition has been detected steadily for at least 18 hours. This is a true warning light. The benefit to the user is a reduction in the frequency of blowdowns, which may extend the life of the related isolation and drain valves, also protecting the conductivity probes from the harsh effects of frequent or excessive blowdowns.

In addition, the SmartLevel system provides a status indication for system communications, which continuously informs the operator of reliable operation. A dedicated green LED for normal operation changes to red in the event of a component or communication issue. Another benefit of the SmartLevel is the white lights located at normal water level, so that operators have an “at a glance” reference to normal, which makes operating levels that deviate from normal very obvious to the operator.

Other new field selectable features include field time delays, test circuitry, an alternate indicator mode for colorblind operators, and a reduced number of conductors for field wiring. This new generation of conductivity probe level sensing technology has been proven successful over the past year at multiple locations in some very harsh outdoor power plant environments, while achieving a high degree of satisfaction from the users.

FIGURE 1



conductivity probe (sensor) is in contact with water or not. Most modern systems are capable of detecting very low conductivity water.

The typical users of conductivity probe type boiler water level indication systems include power plants, food processors, breweries, chemical plants, refineries, universities, central steam heating plants, and many industrial plants. The common need between all of these users is the proper management of water levels

Clark-Reliance originally introduced the Electro Eye-Hye Drum Level Remote Level Indication System in 1959 to the power industry. The system employs technology based on detecting the conductive property of the water level in a boiler drum with sensors (called conductivity probes) that are strategically located on a vertical manifold (called an Electrolev Column) that is piped to the boiler drum along with isolation and drain valves (See Figure 2).

These probes are physically wired to a control unit, which can be mounted in virtually any environment at distances up to 100 ft (33+ meters) from the boiler drum. The control unit is also wired to a remote panel indicator, which consists of a series of LED lights at designated levels detected by the conductivity probes. The panel indicator is usually located in a prominent location on the control room wall or console to enable the operators to easily observe the drum level continuously. The control room indicator can be installed up to 1 mile from the boiler drum. Some users specify a second indicator mounted on the control unit or in a separate weather proof enclosure located near the area of the plant where the control valves are operated for operator convenience.

The control unit also provides contact switches for any selected level sensed by the probes, which can be used for alarm or trip purposes. This feature adds an additional function to the system to aid boiler operation and safety.

Over the past 50 years, Clark-Reliance has produced over 10,000 systems installed worldwide. Many control room operators report how satisfied they have become with this dedicated system to monitor drum level, which is critical to any operator.

The new SmartLevel Eye-Hye system is the direct result of more than 50 years of field experience, working with boiler manufacturers, contractors, and operators, to provide a near maintenance-free, reliable, and safe instrument for monitoring the boiler water level.

Some of the other features of SmartLevel Eye-Hyes include the following.



FIGURE 2

Some users specify a second indicator mounted on the control unit or in a separate weather-proof enclosure located near the area of the plant where the control valves are operated, for operator convenience.

1. A very safe low-voltage circuit to the conductivity probes.
2. Bright LED panel indicating lights, which were originally introduced in 1986 and have proven to provide more than 15 years of average service life, even in harsh environments. Now, they are brighter than ever.
3. An optional 4-20 mA output signal to

provide an additional output signal interface.

4. A 4-wire indicator circuit, which reduces the number of required conductors compared to previous models.

Clark-Reliance is an industry leader with many level instrumentation products. This particular product has been instrumental in making Clark-Reliance the most specified brand in America and increasingly worldwide.

The support from users of this technology has also resulted in the development of other similar Clark-Reliance systems for use on “drip leg” applications, condensate tanks, feed water heaters, and for turbine protection, which detects water build-up in steam piping and prevents costly damage in many power applications. **TB**

For additional information, contact your local Clark-Reliance sales office at www.clark-reliance.com. We wish to earn your trust as a user of the SmartLevel Eye-Hye Level Indication System or other level instrumentation for your boiler application.