Monitoring Heat Exchanger Leaks in Paper Plant

The Situation

A paper plant in the Eastern United States uses 500 gallons per minute filtered pond water for cooling lubricating oil in its paper line. The resulting warmed water is diverted to an onsite pond. Because the water is used to cool lubricating oil, the plant could not reuse the water in its pulping process for fears of possible oil contamination of the paper pulp.

Problem

The plant needed to be able to reuse the water to reduce its energy and water filtration costs. The paper plant looked for a leak detector to quickly indicate when the lubrication oil coolers leak. Samples of the target oil were analyzed to determine if fluorescence could quickly measure the oil at less than 1 part per million.

Solution

Numerous technologies and products were evaluated for this application. A monitor with no moving parts, no significant effect from turbidity, and the ability to detect the lube oil at less than 1 ppm was determined to be the best solution. Fast, reliable, and accurate detection of lubricating oil in the water was needed.

Samples of the paper mill's lubricating oil were collected and sent to the Turner Designs Hydrocarbon Instruments factory. It was determined that the lubricating oil could be detected at less than 1 ppm, with minimal effect from turbidity, and with no moving parts. Other technologies like turbidity and UV absorption were considered, but due to the pond water source, these technologies would give false indication of oil due to the presence of solid particles and other organics in the water.

Using a TD-500D hand held oil in water analyzer, the customer was able to quickly detect a leaking heat exchanger. Using a TD-4100 series monitor to provide continuous online detection of lube oil, they were able to verify that the water could be reused in the pulping process, with a reduced energy cost.