

## Maintaining Quality and Safety in Molasses Production with Real-time Temperature Readings

Plant Name: Condiment Producer

Industry: Food and Beverage

Product(s): Molasses and Sugar

### Application

Temperature monitoring plays a key role in the quality and safe storage of molasses. In 1919 the Boston molasses disaster (The Great Molasses Flood) occurred when a storage tank exceeded safe temperatures, leading to an explosion. When temperatures rise over 40.5 degrees C, the structure of the sugar molecules begins to degrade. This process also leads to increased pressure, which can rupture storage vessels if left unchecked.



*Condiment producer's processing plant for molasses and sugar*

### Challenges

The practice of manual operator rounds to collect data is still common throughout the process industry, especially in remote plant areas such as tank storage units. Manual rounds do not provide continuous measurements—which means that variations in process conditions, such as temperature, can go unnoticed.

At one North American condiment producer, the operations team began to experience a degraded quality of their molasses. The team suspected that high temperatures were occurring in the tank storage unit, leading to concerns about safety. Instrumenting the tanks with temperature monitoring would be costly because there was no existing automation infrastructure. Increasing the manual rounds was a temporary solution, but this placed too much strain on already busy operations personnel. The operations team needed another solution that met monitoring requirements and was cost-effective.

### Solution

To enable continuous monitoring of molasses temperatures cost-effectively, the condiment producer turned to Yokogawa's ISA100 Field Wireless solution. Two YTA510 Wireless Temperature Transmitters were installed on the molasses storage tanks. The wireless transmitters use standard antennas with a range of up to 600m. Since

the molasses tanks are approximately 400m from the control room, it was possible to establish robust and reliable communications directly with the YFGW520 Field Wireless Access Point without the need for repeaters.

The low power consumption for the wireless devices enabled further savings by reducing current draw from the battery. The YTA510 Wireless Temperature Transmitters can achieve a proven battery life of 3.6 years with measurement updates every second.

A Modbus to EtherNet/IP protocol converter connected the YFGW410 Field Wireless Management Station to the Allen Bradley PLC host system. The YFGW410 and protocol converter were readily located in the control room, while the YFGW520 access point was mounted outside to improve wireless quality.

By utilizing the proven benefits of Yokogawa's ISA100 Field Wireless solution, the condiment producer significantly reduced project installation time and expenses while achieving the desired temperature monitoring performance. The operations team was able to reclaim valuable time by reducing manual operator rounds. Overall, the plant improved molasses quality and safety while realizing a rapid return on investment.

## Key Advantages

- Since wireless measurement made it easy to monitor storage temperature continuously, operation efficiency and plant safety improved.
- Simplified installation with no wiring, no routing problems, and no maintenance issues has minimized plant start-up and downtime.
- Low power devices with a proven battery life of 10 years with 30-second updates and non-proprietary battery cells have reduced maintenance.
- The industry-proven platform enables easy and seamless integration with interfacing with a wide range of host systems.

