

# Biodiesel Fuel Plant Experiences Greater Throughput with Reliable Level Measurement

## RESULTS

- Reliable and accurate level measurement
- Control of level in the reboiler
- Increased production of biodiesel



## APPLICATION

Glycerin level in a reboiler. Operating at a high temperature, the glycerin is boiling and heavy diesel vapors are present. There is a great deal of turbulence and a small measurement span.

## CUSTOMER

A biodiesel refiner in the United States. This refiner uses a variety of raw materials, including waste meat products.

## CHALLENGE

A producer of biodiesel had requirements for level detection in horizontal reboilers. The process conditions and the physical shape of the reboiler make this a challenging level measurement.

Within the reboiler, crude glycerin is heated to a high temperature under a vacuum to separate the biodiesel. The glycerin level must be maintained above the steam heating coils. When the glycerin boils, there is a great deal of surface turbulence. The reboiler is only 24 inches in diameter, and the measurement span was a tight 18 in.

Another challenge was the occasional presence of plastic contaminants with the incoming raw materials. This plastic material would tend to create plugs in any small openings.

It is important to maintain consistent level control in this fast-moving and turbulent application. If the level drops too low, the heating coils can be exposed, risking damage to the reboiler. If the level is too high, there is a risk of flooding the downstream process.

## SOLUTION

The Rosemount 5300 Guided Wave Radar with a HTHP (High Temperature, High Pressure) single rigid probe was installed. The HTHP probe is designed to prevent leakage and performs reliably when exposed to extreme process conditions for extended periods of time. The ceramic seals and graphite gaskets, welded into a stainless steel sleeve, provide multiple layers of protection.

*Use of a single lead probe eliminated contamination issues from the process fluid.*



*A Rosemount 5300 with a HTHP single probe was installed directly into the glycerin reboiler*

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The HTHP probe provides a temperature and pressure barrier in a flexible assembly to handle forces induced by probe movement and temperature variations. Advantages in using the HTHP single rigid probe are that it can tolerate coating or plugging caused by the plastic contaminants, withstand high temperatures and pressure extremes, and functions well in turbulent conditions.

For the transmitter, the Rosemount 5301 Liquid Level Guided Wave Radar (GWR) was installed. The 5300 series has Direct Switch Technology (DST), which provides a Radar signal that is 2 to 5 times stronger than other GWR transmitters. This allows the transmitter to be used reliably in an application that required a single lead probe, but had heavy turbulence due to the vacuum induced boiling. It was able to control the level over the narrow range. Controlling the level in this reboiler allowed this biodiesel facility to obtain a higher throughput to meet rising biodiesel demands.

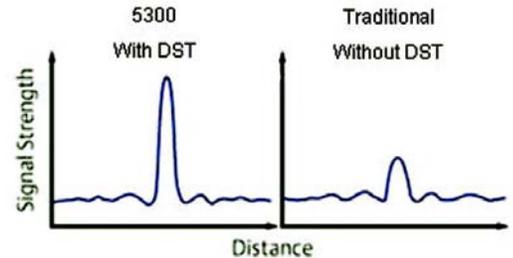
### RESOURCES

#### Rosemount Level

<http://www.emersonprocess.com/rosemount/products/level/index.html>

#### Rosemount 5300 Series

<http://www.emersonprocess.com/rosemount/products/level/m5300.html>



*DST maintains a stronger signal for more severe and changing process conditions.*

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