

Biotech Facility Increases Throughput on Fermentation Vessel with Rosemount® Electronic Remote Sensors

RESULTS

- Improved batch quality
- Increased enzyme production on fermentation vessels
- Decreased operations costs



APPLICATION

Level measurement on enzyme fermentation vessel

APPLICATION CHARACTERISTICS

- 60-ft. vessel (18 m)
- Process agitation
- Sterile environment

CUSTOMER

Agricultural enzyme facility - USA

CHALLENGE

A biotech facility located in the Midwestern United States was experiencing recurring problems with a tall vessel used for enzyme fermentation. In particular, the vessel was producing inconsistent batches.

The measurement solution installed on the 60-foot vessel included a pressure transmitter with remote diaphragm seal at the bottom of the vessel, and impulse piping with a pneumatic repeater running from the top of the vessel to the low-pressure side of the pressure transmitter.

A series of challenges contributed to engineers' inability to get a repeatable level measurement on the vessel:

- Agitators in the tank turned the process over in three to five minutes, creating fluctuating levels.
- The extremely slow response time of the measurement solution was suboptimal for level control.
- The use of a mechanical repeater on such a tall vessel caused measurement errors that often exceeded 3-5% of span, with frequent spiking.

“This vessel went from being our worst performing to our best performing”

Plant Instrument Technician

The lack of a repeatable level measurement was an ongoing source of frustration. Engineers double-checked measurements throughout the entire process, but without accurate measurements on the fermentor, it was impossible to calculate yield. Batch quality and throughput were inconsistent, and operation costs increased.

SOLUTION

The biotech facility updated the existing installation on the fermentor with Emerson's Rosemount 3051S Electronic Remote Sensor (ERS™) System. The 3051S ERS system consisted of two pressure sensors linked together digitally. Differential pressure was computed in one of the sensors and sent back to the control system via a 4-20 mA/HART® signal. With the digital DP architecture, engineers could eliminate the impulse piping and mechanical repeater that were causing many problems. Installation of the 3051S ERS system was simple: It was installed in the same manner as the earlier solution and required no changes to the vessel connections.



Rosemount 3051S ERS System

Once the measurement was up and running, engineers noticed a drastic improvement in response time, and they were able to accurately and quickly track changes in the tank level that previously went unnoticed. Additionally, the measurement accuracy improved: Engineers estimated that errors decreased from 3-5% to less than 0.5% of span.

By consistently measuring the level in the vessel, the facility now is able to produce more enzymes in the fermentors. An instrument technician at the facility stated, “This application used to be our biggest headache, but now the fermentor is our first choice depending on the quality of product needed.”

RESOURCES

Emerson Process Management Chemical Industry

<http://www2.emersonprocess.com/en-US/industries/Chemical/Pages/index.aspx>

Rosemount 3051S Series

<http://www2.emersonprocess.com/en-US/brands/rosemount/Pressure/DP-Level-Products/3051S-ERS/Pages/index.aspx>

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