RESERVOIR MONITORING SOFTWARE WITH FAULT TOLERANT DATA PROCESSING CAPABILITIES

REAL-TIME DATA COLLECTION AND ANALYSIS SYSTEM ENABLES RESERVOIR MONITORING

Abstract

A diversified upstream oilfield services company with 87 manufacturing facilities and 730 service centers across 100 countries had an extensive portfolio of drilling, completion, production, and intervention applications. Raw data accumulated from different process instruments was converted into engineering data – pressure, temperature, flow rates, phase fractions, etc. – and ported onto upstream applications in real time for decision making.

The company engaged Infosys to implement a reservoir monitoring system to enhance the quality of data by capturing and processing data in real time. We proposed a system with fault tolerance as well as auto-error detection and correction features.

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Extracting insights from data

Infosys developed the remote monitoring system with advanced capabilities for continuous data collection, analysis of data, and sharing accurate results. We built multiple interfaces for data exchange, including Transmission Control Protocol / Internet Protocol (TCP / IP), USB, RS232, web, flat files, and protocols. The system has an extensible architecture supported by Modbus SCADA, PROFIBUS, WITSML / POSC, PRODML, and OPC protocols.

We developed algorithms to continuously measure oil flow rate, downhole temperature, phase fraction, bulk velocity, and pressure. Our system facilitates real-time analysis of data, including transient analysis of pressure data. We created Digital Signal Processor (DSP) firmware for pre-processing of optical phase modulated signals. A highly scalable architecture for data acquisition, easy configurability, and hardware diagnostics capabilities enable onboarding of new sensors and hardware.

The system provides a repository for data from the Distributed Temperature Sensing (DTS) system, and pressure, temperature, quartz, OPC, velocity, sound, wellhead, and strain sensors. Site engineers use sensor readings and data visualization tools to take informed decisions.

The Infosys system supports end-to-end reservoir monitoring activities. Our intuitive interfaces minimize training of field engineers. Significantly, a single user manual covers functionalities of the reservoir monitoring system.

Simulate reservoir behavior

Infosys accelerated product development of the reservoir monitoring system by following best practices:

- Simulating hardware by developing advanced simulators

- Prioritizing requirements by interacting with field staff

- Conducting knowledge-sharing sessions

- Executing release management using automation tools

- Leveraging the Global Delivery Model across the software development life cycle

For more information, contact askus@infosys.com

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