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CASE STUDY
Oil & Gas Advanced Analytics

Leak Detection

OVERVIEW
An independent oil and gas operator reduces their environmental impact and improves their social license to operate through the use of advanced analytics.

THE BUSINESS CHALLENGE:
A medium sized independent oil and gas operator with a large presence in the Eagle Ford basin was looking to reduce their environmental impact and improve their social license to operate. The operator had over 150 central processing facilities (CPFs) in the area and set out to create an early leak detection and spill prevention system. In CPFs, the crude oil, natural gas and water must be separated, treated, measured, sampled and hauled off. From the well head to the transportation system, regardless of whether it is trucks, tanks or pipelines, it is imperative to keep the produced hydrocarbons in the pipe. The goal of this solution was to leverage real-time predictive analytics to reduce their reportable spills and thus improve their social license to operate.

THE BAKER TILLY APPROACH:
The Baker Tilly team first analyzed the sensor data captured from well heads, pumps, tanks and other equipment and began to clean and time-align the data to better enable predictive model development. Once the historical data was cleaned and organized, multiple machine learning models were trained and tested. The optimal performing model was selected, scaled and deployed with the capability of auto-retraining the model. All data pipelines, storage and compute for the solution were developed and managed in the cloud. The team determined a sensor polling frequency of 15 minutes was adequate to meet the goals of the solution while minimizing cloud cost. The entire advanced analytics pipeline integrated seamlessly with current established workflows. This solution successfully transitioned to the surveillance team without interrupting operations.

THE BUSINESS IMPACT:
Baker Tilly's collaboration aided the oil and gas client to better:

— Identify and prevent tank spills and system leaks by more than 90%
— Dispatch appropriate risk mitigation teams more efficiently
— Curate more accurate data to provide corporate systems additional downstream value
— Reduce water hauling by 15%, resulting in reduced costs
— Identify unscheduled drawdowns, leading to greater theft awareness and investigation

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