ENERGY
Predictive Maintenance

ps ai labs Devron

Reduce Natural Gas Production Deferrals by 15-20%

CASE STUDY

AT A GLANCE

DATA LANDSCAPE

- Disparate
- Unstructured
- Heterogeneous
- Various Formats
- Terabytes

BEFORE

- Unpredictable gas production downtimes
- Huge intervention costs for frozen or shut-in natural gas wells

AFTER

- Reduced production deferrals by 15-20%
- 70% model prediction success rate
- Projected to save 600K MSCF in deferred gas volume annually

CHALLENGE

Natural gas wells have a propensity to “freeze” or “shut-in,” which defers gas production and requires huge intervention costs to disperse the obstruction or to install a downhole pump. Predicting when each natural gas well is at risk of freezing and when it is likely to need a downhole pump installed is a very challenging problem, but knowing the risks in advance enables businesses to take effective prevention measures and actions. PS AI Labs & Devron engaged with a Fortune 100 global oil and gas organization to predict maintenance requirements three months in advance to optimize maintenance resources.

SOLUTION

Over a terabyte of sensor data was harnessed to identify and predict well freeze events on 1,700 wells. The data was mostly from wellhead and separator tanks and included temperatures, pressures, tank levels, and flow rates. Also, operational reports of freezes and records of well design, well environment, and production history played predictive roles in the models. The data was large, diverse, noisy, often erroneous, and incomplete. With input from the client, key ratios that affect each well’s propensity to freeze within the next three months were calculated. PS AI Labs used Devron's federated learning platform to build models across the datasets that could predict freezing times better than any previous efforts. During the data discovery and model build process, the insights about predictive relationships were reviewed periodically with client subject matter experts, and proposed models were thoroughly vetted by the client using a blind validation process.

RESULT

With PS AI Labs' expertise and Devron's federated learning platform, our predictions for optimizing the timing of plunger pump installation was projected to reduce production deferrals by 15 to 20%. The Downhole Freeze model had a 70% success rate. The insights therein helped the client prioritize well interventions and optimize maintenance resources to reduce freeze remediation costs by millions of dollars. It was projected to save 600,000 MSCF (million standard cubic feet) in deferred gas volume annually.

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