Solution Story: Engineers find a permanent solution to a gas condensate plant shutdown

Engineering Village surfaces insights needed to keep the plant up and running
A large O&G company is experiencing recurring shutdowns at a facility that produces gas condensate. Engineering Village provides the firm’s engineers with the search, analytics and navigation tools they need to address the shutdown issue while avoiding costly modifications that could stop production for 18 months.

Challenge

A large, multinational O&G company produces about 40,000 barrels of oil equivalent per day at a gas condensate facility. Over the past three years, the plant has suffered repeated periodic shutdowns due to safety trips in the condensation system. Plant operators have attempted a wide variety of adjustments to keep the system working. These fixes return the plant to operation, but the condensation system shuts down again within weeks.

When a safety trip once again closes the plant, the company tasks a new operations team leader to find a permanent solution to the costly shutdowns. One option would be to replace the compressor, but that would take a minimum of 18 months and cost at least $8 million. With the clock ticking and revenues being lost every minute the plant is down, Darja Lipp* and her engineering team start looking for a less costly long-term solution.

Lipp’s team takes a 5 Whys approach to determine the relationship between the different variables involved in the condensation system and to help identify the root cause of the problem. The engineers know that the amount of liquid dropping into the system’s scrubber is considerably higher than the facility’s control system can handle. The team also notices that a compressor is giving off a negative temperature reading, which is unexpected because compressors are usually a hot temperature environment. As the team digs deeper into its 5 Whys analysis, the engineers realize that they don’t understand the reasons underlying the condensation system’s failure.

* For confidentiality purposes, names have been changed
Solution

To answer its questions about the root cause of the safety trips, the team starts researching in the company’s engineering library. Using Engineering Village, the engineers quickly find a wealth of information on topics relevant to their research, including gas condensate operating conditions, scrubber performance and compressor efficiency. Lipp’s team consults a wide range of materials available through Engineering Village, including research papers, investigations and case studies. In the course of an afternoon, team members discover that other engineers have previously encountered the same problem they’re facing.

Research materials surfaced by Engineering Village provide the team with useful background information and key insights into the factors underlying the condensate system’s problem. Using this information, Lipp and her engineers successfully zero in on the interrelated factors that are causing the compressor shutdowns. They conclude that several steps will resolve the safety tripping issue, including increasing the pressure set point on the separator, scrubber and compressor inlet. These actions will result in warmer gas being carried through the compressor and will reduce its residence time in the compressor’s vessel. After these modifications are incorporated into the production process, the safety trips stop occurring.

Business impact

Engineering Village enabled Lipp’s team to resolve the shutdown issue within eight hours of the safety trip. Using the platform’s multiple engineering databases, the team surfaced a case study of another plant that experienced a similar problem, and the team adapted the insights from the resolution of that plant’s problem to the situation at their own plant.

By solving the compressor malfunction that was sporadically tripping the safety system, the team helped the company avoid spending $8 million on an unnecessary fix. The team’s solution is also preventing costly shutdowns. Access to the Engineering Village platform provided the quality content, analytics and intelligence the team needed to successfully solve its problem and prevent further shutdowns. The plant has been operating continuously since the engineering team made changes to the condensation system.
Engineering Village

Engineering Village is an engineering search & discovery platform that provides the quality content, analytics, and intelligence needed for engineers to improve their research success. For companies investing in engineering R&D, Engineering Village helps your team be confident in early-stage research decisions, complete the research stage-gate faster, identify impactful trends and collaborators, and solve engineering problems.

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