Solution Story: Engineer Designs Offshore Platform Modifications, Saving $1.1 Million

Engineering Village provides research and insights to avoid production shutdowns
A large multinational O&G company operates an offshore platform that is experiencing periodic shutdowns due to rupture disk blowouts in a water cooling system. A company engineer successfully addresses the shutdown issue by relying on Engineering Village’s search, analytics and navigation tools to find relevant information and discover insights.

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Challenge

A large multinational oil and gas company encounters a serious intermittent issue with the water cooling system at one of its offshore platforms. Taking seawater into the cooling tanks sometimes causes a rupture disk to blow out. As a result, water floods into the platform’s flare system, causing a complete production shutdown. To address the problem, the company hires a consultant, who recommends changing both the scrubber and the type of rupture disk used in the cooling system. These modifications would cost the company $1.8 million.

When another blowout and shutdown occurs, the company assigns a newly hired lead engineer to address the problem. Signe Branner* examines the consultant’s report and senses that some factors may have been missed. She needs to find a different, lower-cost solution that will get the platform back online as quickly as possible and permanently resolve the recurring disk blowout issue.

* For confidentiality purposes, names have been changed
Solution

To answer her questions about the rupture disk issue, Branner turns to Engineering Village as a one-stop engineering search, discovery and analytics platform. Using its robust search features, she takes a deep dive into the literature, focusing on exchangers and the effects of water hammering. She finds a massive amount of relevant information that she easily filters down, learning that it’s crucial to follow specific procedures when installing a new rupture disk. Improper handling of a disk can compromise the integrity of a disk even before it’s installed, and the platform crew has not been following the best practices that she finds.

Branner also discovers that reducing the set point of the rupture disk will ensure that it will provide an alert before a rupture occurs, as it’s designed to do. At the platform site, the set point for the water cooling system’s rupture disk had been set too high — calibrated for hydrocarbons rather than for water. As a result, rupture disks had been blowing out rather than sending alarms. Based on her research, the engineer makes two key modifications: introducing new rupture disk installation procedures and lowering the disk’s set point so that it will alarm before blowing out.

After these modifications are put into operation, the rupture disk is no longer blowing out, but it starts sending alarms. To get to the bottom of the problem, the engineer returns to Engineering Village to gather additional information and insights. She quickly finds a highly relevant paper that examines cooling systems used on oil and gas platforms. She discovers that during the water intake phase, vacuum spots may arise within the cooling tanks. Because the cooling system is a closed-loop system, these vacuum spots can lead to a pressure surge, which may cause a rupture disk to alarm or blow out.

As a result of this insight, Branner realizes that the procedures for initiating water intake into the cooling tanks, or priming, are vitally important. To avoid the creation of vacuum spots during the priming stage, she reworks the platform’s water cooling system start-up procedures to follow best practices.

Since the adoption of the new pressure set point for the rupture disk and the modified priming procedure, not a single rupture disk has blown out over the course of the past five years. To avoid future problems, Branner also set an alert for the term water hammering in Engineering Village to keep up to date on improving technologies that prevent rupture disk blowouts.

Business impact

Engineering Village was the gateway to uncovering the background information and insights that Branner needed. Implementing her solutions to the rupture disk and priming problems cost $750,000, more than a million dollars less than the $1.8 million solution recommended by the outside consultant. In addition to these immediate savings, avoiding shutdowns has enabled the platform to meet its production targets and optimize the company’s revenues.

Having multiple, valuable engineering databases in a single solution — with content indexed in the language of engineering — helped Branner save time, improve her research success and solve potentially costly engineering problems.
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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