

CASE STUDY Crane's ValveWatch™ System Detects Leaking ESD Valve on Remote Offshore Platform; Provides Critical Advance Warning

Overview

The ValveWatch system was developed to verify the ability of critical SDV's to perform as required during an emergency. Installed on Statoil's remote Gullfaks C production facility, ValveWatch accurately detects a damaged valve seal on a critical SDV through automated daily testing. Maintenance personnel confirm the damage during a scheduled shut-in, and repair the valve with minimal interruption to production. Without ValveWatch, the damage could have gone undetected, causing considerable risk to the facility and endangering its personnel.

Background

Located in the northern section of the North Sea, the Tampen area holds many of the largest fields on the Norwegian continental shelf. Off the coast of Norway in the harsh North Sea environment, the Gullfaks C gravity base platform is one of three integrated drilling and processing facilities delivering critical supplies of oil & gas to Norway and the UK. ValveWatch™ was first installed on Gullfaks C in 2002 in response to a request by Statoil for a condition monitoring and testing system for the facility's critical Shutdown Valves (SDVs). Designed as an early warning system of symptoms leading to valve seal failure, ValveWatch™ automatically collects and analyzes test data from several points within the valve, and provides feedback to operation and maintenance personnel regarding the valve's operating condition.

Following the Piper Alpha accident, the Norwegian Petroleum Directorate (NPD) increased pressure on oil companies operating in the North Sea to verify, through periodic testing, the ability of critical SDVs to perform as required during an emergency. Statoil and Norsk Hydro struggled with the impact of traditional SDV testing requirements on production output, as the valve must be shut-in to conduct a test. As a consequence, Statoil, Norsk Hydro and CRANE Valve Services collaborated on the development of an automatic monitoring

system for SDVs that tests a valve while it is flowing, eliminating the need to shut-in for a manual test. The ValveWatch™ system is the result of that collaborative effort.

Issue

In October 2003, ValveWatch™ raised a leak alarm for a monitored valve on a North Sea platform. After a detailed review of the acquired data, the ValveWatch™ analyst concluded that it was likely that the valve seal had been damaged, and continued operation without repair might risk the integrity of the platform's Emergency Shutdown System and endanger the personnel working on the platform.

Resolution

During a planned shut-in, maintenance personnel conducted a manual leak test on the valve in question. The manual test confirmed that a seal within the valve was leaking, preventing the valve from sealing properly. Appropriate maintenance procedures were immediately conducted on the valve, bringing it back to its normal operating condition. Immediately following the repair, an additional manual leak test was performed to ensure the valve was no longer leaking. With the valve back on-line, automated test data received by ValveWatch™ confirmed that the valve had been restored to its normal operating condition.