

PYROBAN[®]

STATOIL: EXPLOSION PROTECTED CRANES

Norway

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STATOIL VEHICLES GET EXPLOSION PROTECTION

WITH THE INTRODUCTION OF TWO NEW PYROBAN PROTECTED 'CRANES' AT THE KOLLSNES GAS PROCESSING PLANT IN NORWAY, STATOIL CONFIRMS ITS COMMITMENT TO MAXIMUM SAFETY AND DEMONSTRATES BEST PRACTICE FOR VEHICLES USED IN A HYDROCARBON PROCESSING PLANT.

The Kollsnes gas processing plant, located to the west of Bergen, Norway, processes rich gas received from fields in the North Sea. The plant has the capacity to export 143 million standard cubic metres of Natural Gas (NG) and 69,000 barrels of Natural Gas Liquid (NGL) per day. At this capacity, the plant provides approximately 12% of the EU's demand for gas, making it an important part of the gas supply chain for Europe.

Day to day operations at Kollsnes are provided by the international energy company Statoil, which sets absolute requirements for health, safety and the environment (HSE).

"We are due to begin a seven year project which involves updating all access at Kollsnes by replacing handrails, kick-plates, stairs, grating and platform structures from plastic to galvanised steel," says John Polley from Statoil. "This project requires continuous crane use of up to 300 days a year within Zone 2 hazardous areas.

"Our challenge was to reduce the time consuming and costly task of issuing 'hot work permits' for vehicle entry into hazardous areas," says John. "Permits are not always issued, numerous personnel are involved and ignition sources may still be present. There is also too much reliance on human factors."

ATEX compliant 'cranes' for Zone 2 areas

The Statoil team in Kollsnes looked at the possibility of using ATEX* compliant cranes that could work in normal operation to avoid the need for hot work permits. However, they could not source any for hire from anywhere in the world and it was even suggested that such vehicles are not readily available.

Norman Olsen Maskin AS, an equipment supplier in Norway offered a solution for Statoil which included two Manitou MRT 3050 rotating telehandlers that can lift 5 tonnes, with a boom reach of nearly 30m. By working with explosion protection company Pyroban, the 'cranes' were supplied with full ATEX compliance for safe

operation in Zone 2 hazardous areas.

The Pyroban solution included system6000 which prevents explosions by combining gas detection with various explosion protection methods such as restricted breathing enclosures and surface temperature cooling to ensure the engine, motors, brakes, electrics and other components remain below the auto-ignition temperatures.

Robin Chapman, Principal Engineer for Pyroban Ltd describes some of the challenges "Tests revealed that the original turbo charger ran at temperatures in excess of 700degC and the target surface temperature for all components post conversion is only 200degC. We developed a water cooled turbo to replicate the original performance."

Each year, Pyroban converts nearly 800 forklift trucks but only a handful of cranes. One unique challenge was the cab heating as the cab rotates 360deg preventing the use of hot water from the Perkins engine to provide the heat.

"To ensure driver comfort in the subzero Norwegian winter we reversed the cycle on an air conditioning unit which provides plenty of heat and prevents condensation," adds Robin.

Two Pyroban system6000 control modules were used allowing for four gas sensing heads positioned at strategic points on the telehandlers. When any of the pellistor heads detect a gas at 25pc LEL (propane in air) it shuts down the equipment, isolating all the electrics.

The system auto-calibrates and self-tests the gas heads at start up to ensure the system is working correctly, eliminating the need for periodic and costly site visits by engineers having to recalibrate the gas detection system. system6000 is ATEX 94/9/EC (now ATEX 2014/34/EU compliant in line with EN 1755:2000+A1:2009 and in this case EN 1834:1.

Statoil requested a SIL (Safety Integrity Levels) rating for the four headed system which was calculated by independent Notified Body, Sira Test and Certification. A SIL rating of 3 was confirmed which is extremely high, satisfying Statoil's requirements. John Polley

from Statoil explains “Full ATEX protection is essential for this type of application which is readily available with the support of Pyroban. There was excellent teamwork from Manitou in France, Pyroban in the UK, Norman Olsen Maskin AS and Statoil in Norway.”

A 6m trailer is also attached to the telehandlers to transport the access components and supplies to the work area. The railings are in 2m sections for example and although they are not that heavy, there are thousands of them. The use of a trailer has avoided the need to convert a supply lorry to Zone 2 or introduce further hot work permits.

Shutdown system for perimeter road vehicles

Statoil already had a strong working relationship with Pyroban thanks to more than 50 Pyroban Gascheka gas detection and shutdown units installed on mobile equipment used on the perimeter roads.

“We deal with two main issues at Kollsnes. Firstly we look at normal operations which cover the classification of hazardous areas into Zones and secondly, we look at ‘what if’ scenarios which cover major accidents, considered small, medium or large gas releases,” says Hans Petter Fredriksen, from Statoil who confirms the simplicity of the ignition triangle and its role in defining strategy.

In 2007, Hans Petter wrote a report for the Statoil Executive Board titled ‘best practice for ignition source control associated with the use of vehicles in Statoil’s land plants’. By 2009, all vehicles used on the ring road to carry staff, tools and materials were fitted with Pyroban’s Gascheka system, recently featured in a documentary on the Discovery Channel.

“We put so much emphasis on avoiding major hazards. This is a Statoil corporate policy and it means we have ‘extended hazardous areas’ which includes the perimeter roads.

“We can’t rely on drivers to shut down their vehicles in the event of a gas release, so Gascheka does it automatically for them,” Hans Petter says, citing that many accidents at refineries and processing plants came from an ignition source on a vehicle.

“We have a strong safety culture which focuses on the total exposure of an accident to people, the plant and the company as a whole,” confirms Hans Petter.

In September 2012 at Pyroban’s factory in Shoreham by Sea, England, Pyroban hosted a delegation from Kollsnes and Statoil’s head office in Stavanger to see the progress of the crane conversions and discuss safety best practice within Statoil’s land plants.



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ABOUT PYROBAN

Pyroban provide explosion protection solutions for materials handling equipment and diesel engines.

For over 40 years we have been at the forefront of the industry developing products to protect your people, your site and equipment when operating in hazardous & added safety areas.



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Pyroban's explosion protection
solutions contact us or visit our
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