

AXESS



Solutions Designed by Experts





Purpose

- © To innovate safety and develop end user confidence and trust

Value

- © Uniquely positioned to supply products and services that can complement, integrate and support projects from the design stage, through to maintenance and data retrieval services and analysis

Experience

- © A team comprised of experts in monitoring hardware and systems





Global Incidents

- ① High pressure retrieval tools and portable isolations are required for device changeouts under pressure (online)
- ① Incidents reported globally range from loss of containment, severe injury and fatalities
- ① Life extension of assets, diluting field experience, and growing concerns around intrusive monitoring techniques called for innovation to solve several problems
- ① Axess release the Janus™ Guard having consulted with Shell on the design and piloting it successfully

LEARNING FROM INCIDENTS ACTION ALERT

08/04/2014 | All Offshore | August 2013

Call for attention to Shell employees that contractors that cannot stop work and with the consent of the Shell Operations Representative, to use Shell-assigned lockout systems. Refer to the "Lock Out System" if you wish to avoid the time to be spent.

Retrieval of Corrosion Coupons, Piles and Gulls from Pressurized Lines by Means of Pressure-Isolated Tools

Following a fall incident in a Shell Offshore well, the following lessons learned are being shared to help prevent a similar incident from occurring in the future:

- Ensure that the correct equipment is used for the job.
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What happened?

On 11/11/13, in a Shell Offshore well, a fall occurred during the retrieval of a corrosion coupon from a well. The fall occurred when the well was under pressure and the fall occurred when the well was under pressure.

Who is impacted?

All Shell employees and contractors who are involved in the retrieval of corrosion coupons, piles and gulls from pressurized lines.

Offshore - Gulf of Mexico

Incident Investigation & Root Cause Analysis Report

Name of Incident: Thunderhorse Corrosion Coupon Plug Ejection

Business Unit: Thunderhorse Performance Unit

Location of Incident: Thunderhorse Mezzanine Deck

Date of Incident: May 26, 2008

Draft Report
Issued: June 2, 2008

TECHNICAL BULLETIN

Ref: 2-03-034 Rev: 01 Issued: 2008

| | | | |
|---------------------|------------------------------------|--------------|--------------|
| Technical Bulletin: | Subject of Line Mechanical Network | Prepared by: | Mark Wilson |
| Objective Area: | Operating Services | Date: | 1/26/10 |
| Of interest to: | Asset Operations - Operations | Prepared by: | James Wilson |
| Region: | Global | Date: | 2/16/10 |

Description:

This technical bulletin has been prepared following a request from Asset Operations regarding an incident which took place on 17/05/2008 at the Offshore Production Unit (OPU) site in the Netherlands. The incident involved the ejection of a corrosion probe by a third party contractor with no association with Axess. Axess was provided with the details of the incident and was asked to provide a technical bulletin to help prevent a similar incident from occurring in the future.

Examples from the incident report provided to Axess have been included and discussed within this technical bulletin. However, Axess cannot be held responsible for the safety of the third party contractor involved. Where relevant, contractors have been made on the content of the bulletin to help prevent a similar incident from occurring in the future.

A further discussion is included on the impact on their internal operations in general and in particular for the OPU site in the UK. Comments and recommendations on any other OPU sites to which the bulletin applies are also included.

This technical bulletin has been subject to final review by the Asset Operations Manager due to the safety impact of both the incident and technical aspects in general.

Relevance of this Bulletin to Axess:

This technical bulletin contains relevant lessons from the incident investigation report provided by Shell. Comments by Axess on the bulletin are shown in blue and are made on the basis of the report provided only, to ensure that no other investigation into the incident by Axess is required.

Description of corrosion probe retrieval equipment and process:

Figure 1 - List of gas fixtures and location of corrosion probe filling



Impact of Incidents Across our Industry

- ⦿ Fatality in May 2012 lead to many operators suspending online retrieval of intrusive devices
- ⦿ The fatality occurred during the retrieval of an ER probe installed at the 6 o'clock position on a slug catcher line
- ⦿ The access fitting had not been serviced in over four years
- ⦿ Scaffolding was built to accommodate a technician, located directly below the retriever to help support the weight



The challenge

- ⦿ High pressure mechanical access systems
- ⦿ Technique requires pressure balance for safe operation
- ⦿ Equalization channels on carrier plugs can become blocked
- ⦿ Back pressure pumps can be used to ensure balance but are not always available or practical



Blocked equalization channel on a hollow carrier plug



Blocked equalization ports on a solid carrier plug



How the Janus™ Guard Works

- ⦿ Remove the line of fire
- ⦿ **Retrofittable**, auto deploying and built into the retrievers, replacing original components
- ⦿ Axess retrievers with the guard are lighter than other brands without the guard
- ⦿ Low cost, low maintenance and do not require re-certification of technicians



[Click for Animation](#)



Janus Fittings

- ⦿ Seals the external threads from the environment with the O-ring positioned on the access fitting
- ⦿ Radial sealing surface provides an additional seal for the service valve and the pressure retaining cover
- ⦿ The only access fitting with a double seal and double isolation between process and environment
- ⦿ Applies to both **mechanical** and **hydraulic** systems





Horizon Fittings

- ⦿ Access Fittings for intrusive monitoring systems remain unchanged in over 70 Years.
- ⦿ The preferred monitoring location in most installations is the 6 o'clock position and this poses multiple technical challenges that can also introduce risk.





Clearance for retrieval

- ⦿ The required clearance is often not identified prior to design and fabrication
- ⦿ This can lead to fittings welded to the pipe that may never be serviced
- ⦿ In onshore applications access pits may need to be designed and they can accumulate toxic gases and are not always practical or possible



Alternative monitoring points

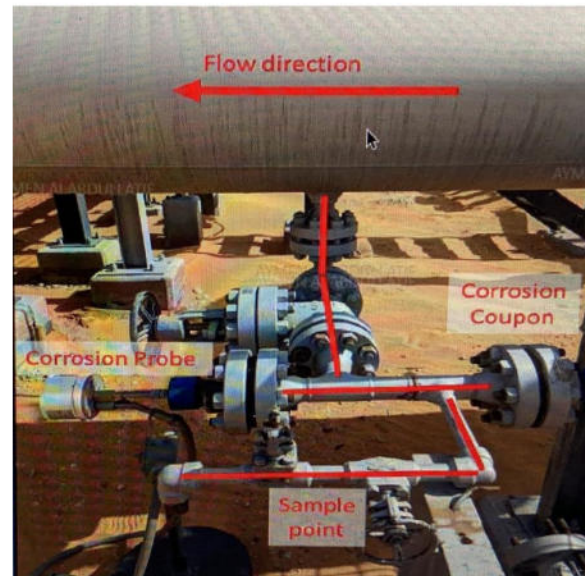
- ⦿ 3/9 o'clock positioning often leads to monitoring the oil wetted surface and not the water wetted surface
- ⦿ 12 o'clock positioning leads to longer devices reaching to the bottom of the pipe
- ⦿ This creates wake frequency concerns and requires longer and heavier retrieval equipment and often the need for scaffolding





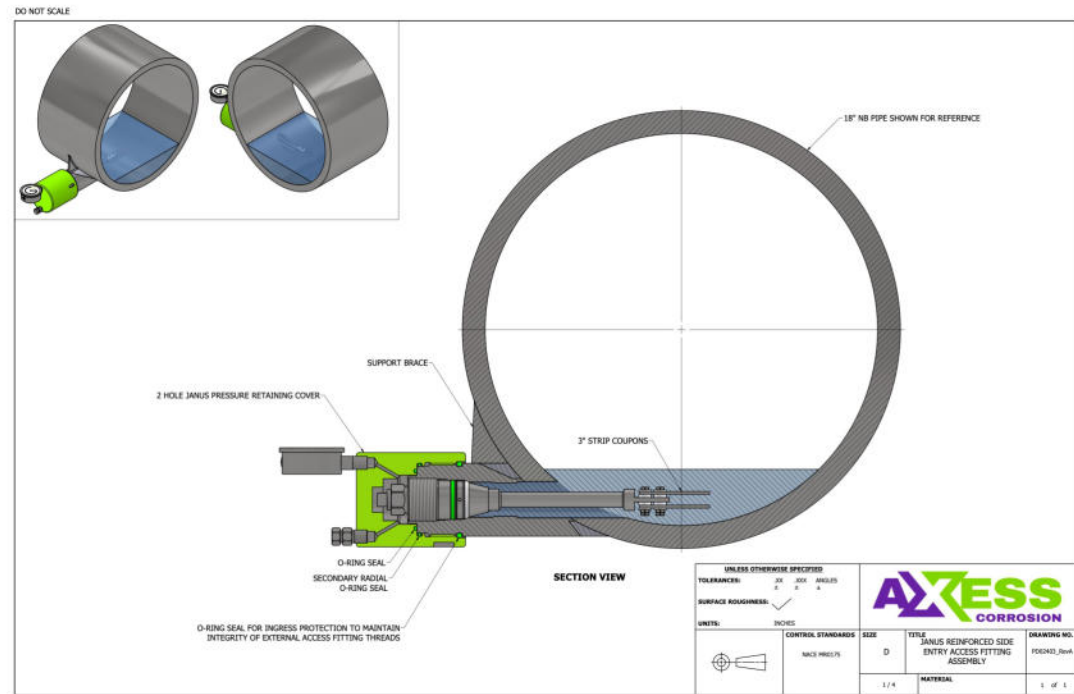
Tee trap arrangements

- ⦿ Introduces a dead-leg branch that's is then connected to access fittings or sample points
- ⦿ Monitoring a stagnant fluid makes the corrosion rate very unreliable
- ⦿ Frequent flushing is required
- ⦿ Cannot be used as a tool for optimizing chemical treatment



Technology overview

- ⦿ A fitting designed for bottom of the line (BoL) monitoring from a side of the line (SoL) entry point
- ⦿ Does not have limitations with ground clearance
- ⦿ Example – Monitor in bottom 10% of a 12" pipe





Technology Overview

- ⦿ Less likely to accumulate debris and choke up the equalization ports
- ⦿ Can be welded using SMAW, hot-tapped and the "cookie" retained
- ⦿ The fitting is designed for tapping
Hollow option is also available





| Parameter | Value | Comments |
|---|---|---|
| Fitting Size | 1" and 2" Mechanical and Hydraulic | |
| Maximum Operating Pressure | 6,000 psi | 10,000 psi available dependent on materials but online retrieving up to 6,000 psi |
| Maximum Pipe Size | 60" | Incline can be adjusted |
| Minimum Pipe Size | 4" | Incline can be adjusted |
| Maximum Operating Temperature | 450°F / 232°C | Dependent on seal materials selected |
| Minimum Operating Temperature | -70°F / -56°C | Dependent on seal materials selected |
| Monitoring / Injection / Sampling Devices | All retrievable monitoring or injection and sampling devices (ER/LPR probes, Corrosion Coupons, Quills, Nozzles etc.) | Pitch and adjust flush holder in final stages of development for flush monitoring, enabling pigging operations etc. Potential for this design to be added to ER probes in future. |



Lower Pressure System Installed Through Permanent Isolation

- ⦿ All threads and nuts can be cumbersome to install and remove, resulting in technicians not installing the safety clamps
- ⦿ Chains are commonly supplied but these have been known to erode and fall off
- ⦿ Chains also introduce pinch point risk when retractors are not used (below 150psi)
- ⦿ Quick release grips allow for easy installation and do not have to be removed

