Case Study

SCM Recovery and Retrofit Campaign - Catcher Field

Client:
Harbour Energy
Location:
North Sea

Project Background

In 2023, a Dril-Quip Subsea Control Module (SCM) from the Catcher Field's CI1 location was recovered following reports of a hydraulic fluid leak. The intervention confirmed that hydraulic fluid was leaking from the gas end valve assembly of one of the three low-pressure (LP) accumulators installed on the SCM.

The faulty SCM was returned to Proserv's Great Yarmouth facility for detailed inspection and root cause analysis.

Findings

The investigation revealed the following:

- The gas end valve was fabricated from low-grade stainless steel (SS 304), which is not corrosion-resistant in subsea environments
- The component was not connected to the SCM's cathodic protection system, leaving it vulnerable to galvanic corrosion
- Corrosion was confirmed as the likely failure mechanism
- The associated accumulator bladder was also found to be damaged; however, it remains unclear whether this failure preceded or resulted from the gas end valve issue

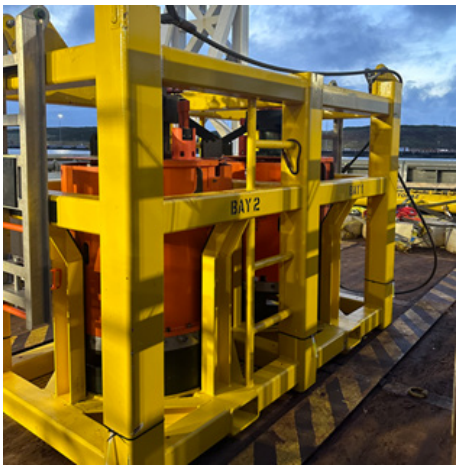
Corrective Action Plan

Upon identifying the issue, Harbour Energy initiated a campaign to recover and upgrade all 24 SCMs in the field. The key upgrades include:

- Replacing the LP accumulator gas end valve assemblies with corrosion-resistent SS 316 components
- Installing earth bonding to ensure future protection via cathodic protection
- Refurbishing two SCMs (Unit 10 and 14) at Proserv's Great Yarmouth facility to serve as operational spares

Scope of Work - Onshore (Proserv Great Yarmouth)

- Development of new test procedures and engineering drawings
- Load testing and replacement of affected components, including:
  - Gas end valve assemblies
  - LP accumulators
  - Filter assemblies
- Removal of all calcifications from anodes to prevent system contamination
- Cleaning of all accessible external stainless steel components
- Assembly of upgraded SCM housing and completion of all required testing



Two off Catcher SCM's installed in deployment basket following remediation works on DSV in readiness for re-deployment

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Scope of Work - Offshore (Proserv scope)

- Removal of SCM side panels and top plates
- Initial visual inspection of internals
- Secondary wash down with panels removed
- Detailed inspection and assessment of LP accumulator gas end valves
- Pre-charge checks and top-up of LP / HP accumulators
- Removal and replacement of affected gas end valve assemblies
- SCM pre-deployment checks following retrofit

Results & Observations

As of the reporting date:

- **12 out of 14 SCMs (86%)** recovered exhibited significant corrosion of the LP accumulator pre-charge components
- **SCM 18 (BP3)** was quarantined after an unsuccessful recovery attempt by vessel contractor, where it fell to the seabed. It was replaced offshore by **SCM 10**
- **SCM 22** was recovered and found to have a pre-fitted earth strap. Dril-Quip confirmed that **SCMs 22 and 20** had previously been upgraded to the latest revision, which includes SS 316 components and proper earth bonding
- **SCM 11** was upgraded onshore at Proserv to the latest specification
- **SCM 19 (CP4)** was successfully retrieved and returned onshore for rework. It was replaced offshore by **SCM 14**

Conclusion

The campaign has effectively identified and mitigated a systemic corrosion risk to subsea infrastructure caused by suboptimal material selection and insufficient cathodic protection.

The proactive retrofit program significantly enhances system integrity and operational reliability across the Catcher field.

Catcher SCM located in storage frame, following completion of remediation works on DSV, in readiness for transferring to the deployment basket for deployment

DSV back deck working area with two Catcher SCM's located in the deployment frame (foreground of photo) and transit frames in background housing spare Catcher SCM's