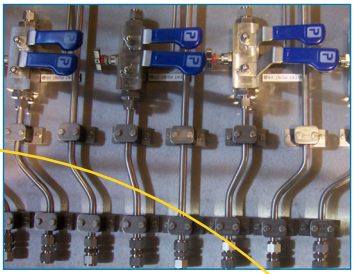
CASE STUDY

BP Clair Ridge - Integrated Instrumentation Solutions



Background

BP's Clair Ridge field, has been a two phase development, located West of Shetland in the UKCS extending over an area of 220km2 in water depths of approximately 140m.

Clair Phase 1 achieved first production in 2005 whilst the second phase, situated north of the original development comprising of two fixed steel jacket platforms with Drilling and Production topsides bridge linked to a Quarters and Utilities platform, is scheduled to produce first oil in Q2 2016.

Customer Issue

The integrity of Small Bore Tubing Instrumentation systems is a major concern for oil and gas operators, with hydrocarbon releases stemming from this source being a major contributor to unplanned releases within the industry.

Recognising and understanding the underlying causes, BP approached phase 2 of the Clair Ridge development with a strategy focused on enhancing the material specifications utilised within small bore tubing systems and reducing the amount of interfaces within their instrumentation hook-up's.

This initiative, driven by experience and the desire for further improvement, addressed previous corrosion related occurrences on offshore assets, as well as concerns surrounding NPT connections which had been previously identified as a suspect threaded connection. It was recognised that the reduction of interfaces, with the introduction of alternative solutions available such as Close Coupling, would reduce the amount of possible leak paths.

BP also identified that a key contributing factor to small bore system integrity issues was a lack of competency surrounding the make-up and installation of fittings and instrument pipework. This led to the requirement for greater assurances from their contractors and package vendors on the new development phase.

There was also a desire to put in place formal management procedures and processes to proactively control and assure the integrity of the Instrumentation systems on the asset prior to the project team handing over responsibility for the asset to the operations team post Q2 2016.

Hydrasun Solution

With BP's metallurgists and design team selecting 6Mo as their material of choice to address corrosion concerns, Hydrasun's Instrumentation solutions team focused their attention on working closely with Parker and Emerson - both world leaders in Pressure & Flow Measurement technologies, in developing a technical file of favored product solutions that challenged traditional hook-up design and would have a direct impact on reducing the number of interfaces on the project.

These preferred direct mount assembly solutions, available to meet both Close Coupled and remote hook ups, offered enough flexibility to meet a wide variety of typical arrangements, and were balanced with a need to ensure manufacturing efficiencies, off-the shelf product availability and commercial competitiveness.

At a glance...

Customer
BP Exploration & Production

Location
Clair Ridge Oil & Gas Field, UKCS

Customer Issue
Against the backdrop of Small Bore Pipework failure being one of the largest contributors to unplanned hydrocarbon releases in the oil and gas industry, how can greater assurances be provided on the integrity of Small Bore Tubing Instrumentation systems on the new BP Clair asset.

Hydrasun's Solution
Hydrasun provided an integrated turnkey solution encompassing product specification and supply, delivery of a competency development programme and the establishment of an integrity management system.

Benefits
- Reduced number of leak paths on customer asset
- Leading to reduced risk of Hydrocarbon emissions
- Improved HSE performance
- Improved competency of personnel
- Establishment of a risk based integrity management strategy & ongoing maintenance programme

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Hydrasun's team worked directly with Parker and Emerson to produce assembly drawings and dimensional charts for all products within the technical file. This collaboration formed the basis of an overall project supply agreement which simplified the selection, quotation and ordering process for AMEC's design team, package vendors and the main EPC contractors on the project.

To further support the project objectives, a Hydrasun technical expert was based within the main project design office, ensuring that the preferred product solutions were integrated easily into the various project hook-up's and that the overall project team understood clearly the various specific manifold models included within the portfolio.

To further simplify product selection and also provide a means of understanding exactly what products had been supplied and to whom, Hydrasun introduced a unique part numbering system enabling accurate tracking of what had been achieved with regards to interface reduction targets.

Whilst wherever possible Hydrasun tried to introduce these new assembly solutions to the project, there were a number of configurations where it was not possible to close couple and traditional runs of tubing & fittings were necessary to connect process to instrument. Even in these situations Hydrasun looked to use the latest in Parker fittings technology e.g. inverted connections to manifold / valve blocks which supported the minimization of NPT leak paths.

Through a large investment in stock of the requisite tubing and Parker fittings in 6Mo materials, Hydrasun managed the varying demands of package vendors and main EPC contractors on the project, avoiding disruptive long lead-times whilst providing cost stability over the project duration.

Competency Solution

Hydrasun developed a bespoke learning programme which was approved and adopted by BP within the project specification as a mandatory requirement for personnel involved in the OEM package build programme.

Delivered in a modular format, enabling it to be tailored to each package vendors requirement, personnel were required to complete both theoretical and practical assessment units which included the identification and make-up of Parker fittings and tubing, utilising project specific materials. This could be done either at the vendors premises or at Hydrasun's ECITB approved training centre in Aberdeen, UK.

Upon satisfactory completion of the training, each candidate received a certificate detailing the modules passed which could then be used as a "licence" to undertake instrumentation product work on their company's package build. A copy of the certificate was provided as part of their documentation package to the BP Clair Ridge inspection team at package acceptance & sign off stage.

Integrity Management Solution

There was also a mandatory requirement for each OEM vendor and key EPC contractors to provide a comprehensive register of the Instrument Tubing & Parker Fittings contained within their build package.

As a market leader in the provision of Integrity Management Services, Hydrasun were able to mobilise their extensive technician resources to vendors worldwide, to inspect the quality of small bore tubing & fitting build, agree necessary re-make's / re-routing / re-installations where required and develop an appropriate register in line with the BP required format.

These registers are being integrated into the overall project Instrument Tubing & Fittings database held by Hydrasun, which is accessible by BP via the Hydrasun internet based Hydralink management tool.

This approach means that at handover of the project, the operations team will have a high-degree of confidence in the integrity of the small bore tubing systems on-board, whilst being ideally placed with the support of Hydrasun to implement an effective maintenance management strategy with regard their Small Bore Tubing systems in going forward.

The Result

By challenging traditional methods of working, a conservative calculation has shown that over 18,000 leak paths were eliminated from the traditional instrument hook up designs developed during the early stages of the project.

By creating and implementing a competency training programme, the most common root causes of loss of containment from small bore tubing systems were addressed prior to asset start-up (e.g. make-up, routing and installation errors) and greater technical assurance and reliability was provided to BP.

Through a proactive approach, the necessary management framework for an ongoing Small Bore Tubing system Integrity Management programme was established prior to project handover to operations personnel.

By delivering an integrated product and service package, Hydrasun provided real added value to BP in terms of speed of response, technical integrity, reliability, reduction of HSE risks and overall life cycle costs.

2-Valve Solution

Transmitter solution

Hydrasun Glasgow
40 Cambuslang Road
Gateway Glasgow
Glasgow
G32 8NB

Tel: +44 (0)141 641 5188 (24 Hrs.)
e-mail: fppc@hydrasun.com
www.hydrasun.com

Head Office
Hydrasun
Gateway Business Park
Moss Road
Aberdeen
AB12 3GQ

Tel: +44 (0)1224 618618
e-mail: info@hydrasun.com
www.hydrasun.com