



NOV Completion & Production Solutions **Representative Solids Sampling Technology and Methodology**

NOV Completion & Production Solutions (formerly Opus Maxim Ltd) carried out the Representative Solids Sampling Technology and Methodology Joint Industry Project from 2013 to 2015. With over 40 years experience in process module and package development, and over 3,000 projects completed, the team of experts at NOV were well equipped to design and fabricate both traditional and custom topside modules.

Solids qualification and quantification is an important area within the oil industry. Fields nearing the end of their life cycle are putting greater strain on solids handling systems and discharge limits. Furthermore, regulations are enforced more stringently. The 5 phase project aimed to create an industry recognised technology and methodology for effective solids sampling and analysis.

The project was supported by Total E&P UK Ltd, BG International Limited, Chevron Energy Technology Company and Statoil Petroleum AS.



BACKGROUND

Having identified the ongoing issue of solids management and recognising the capability to carry out research, design and testing within the facility at Flotta, ITF were approached to help facilitate a JIP, source funding and provide administrative assistance to allow the goals of the project to be realised. Securing funding through ITF was vital in order to allow this piece of research to take place.

CHALLENGE

There are a number of technologies/methods already in existence that obtain representative samples of solids in fluid streams.

This particular project looked at developing a representative, simpler and more reliable method of sampling solids from process streams in such a way that relevant analytical guidelines can be followed to meet regulatory requirements. This is particularly relevant in offshore process streams where all discharges to the sea need to be accurately monitored to meet stringent regulatory targets.

ACTION

The project was split into 5 phases to provide structure:

Phase 1 - Review

The team undertook a market study and technical review of existing solids sampling technologies - investigating the analytical methods and the theory behind solids sampling. This phase allowed for more informed design decisions to be made in the following phases.

Phase 2 - Datum and Development Design

Test loop and sampling concept designs were created for development into prototypes and manufactured for scale testing.

Phase 3 - Concept Testing

Testing took place within the specialist NOV (FKA Opus) test facility.

Phase 4 - Field Trials

Simulated field trials were carried out with partner and sponsor organisations (Total E&P UK, BG International Limited, Chevron Energy Technology Company and Statoil Petroleum AS) to further prove the technology for industry acceptance.

Phase 5 - Final Report

Opus issued the final report with the project results and conclusions.



RESULT

The research and results from the JIP indicated a number of challenges within the piping orientation, layout designs and solids specification variations and there was no single solution that addressed all of these challenges. The sampling did however identify a methodology that evolved through the testing campaign and was developed into a methodology that can be applied to a wide range of asset specific solids sampling restrictions.

Further work was identified for carrying out under a different project.

Since the JIP, Opus Maxim Ltd, now known as NOV Completion and Production Solutions, have moved from strength to strength following the acquisition from Fjords Processing and laterly National Oilwell Varco, recognising the importance and capability of the offshore fluids testing facility in Flotta.

'Assets can now benefit from accurate quantification and reporting of produced solids through the support of this innovative project.'

Lisa Hutchison
ITF Technology Analyst

