

Case study: North Sea

Tri-lateral alliance implements IO3 model, reduces POB, delivers wells without interrupting ongoing production

In October 2019, an operator found itself struggling to meet its desired production targets in a field west of the Shetland Islands. The lack of bed space on the platforms prevented the operator from performing simultaneous operations (SIMOPS) such as infill drilling, interventions, and well production. Compounding the problem was that various aspects of the job were spread across multiple service companies with little unity of focus. The operator needed a comprehensive solution to streamline all operations and increase production levels, ideally by aligning the suppliers to this objective, and reducing the number of personnel on board (POB).

Baker Hughes has a good track record in working with an integrated operations level three (IO3) model to help offshore operators reduce POB. A reimagining of traditional operations, the IO3 model significantly reduces the number of oilfield service POB—relocating all expertise not directly required offshore to onshore facilities—with an eye to minimizing health, safety and environmental (HSE) risks, driving efficiencies, and improving overall performance quality and consistency. This success proved pivotal in the operator reaching out to Baker Hughes to explore a possible collaboration.

Aligning the well plan

The operator, Baker Hughes, and the rig contractor created a tri-lateral alliance to define how the team should behave, operate, and integrate as well as how the IO3 model could be leveraged on this project. An agile

project development team produced a formal agreement between the three companies along with an optimal implementation plan. Baker Hughes assigned responsibility for the well plan's execution to its Integrated Well Services (IWS) team, a group that combines project management expertise with a detailed understanding of Baker Hughes's comprehensive technology portfolio.

Drawing on its prior success implementing the IO3 model, the IWS team's project manager led the alliance team to adopt a novel commercial model upon which all three companies could agree.

Designing the solution

Using a scrum methodology as a framework, all discussions between the three companies were open, transparent, and honest, a task made easier by assigning engineers from the various product lines to serve as focal points. These engineers joined the scrum team early in the process and helped plan the services transition, IO3 implementation, and execution of the work.

An important aspect of the IO3 model involved centralizing all well construction operations with Baker Hughes and displacing the incumbent service companies. What made the transition challenging was to keep the existing operations in place during the handover and not disrupt ongoing operations or impact well production.

The relocation of significant numbers of personnel from traditional offshore roles was another key differentiator

Challenges

- Design an integrated IO3 service delivery model to consolidate the number of service companies
- Reduce POB through IO3 and automation, facilitating SIMOPS
- Achieve production targets by constructing more wells via SIMOPS

Results

- Created unique trilateral commercial model that consolidated all aspects of operation under a single, three-company alliance
- Replaced all key well construction services on the rig with alliance services
- Assembled, aligned, and integrated alliance teams both offshore and onshore
- Reduced POB by up to 20% with no loss to well delivery or performance and:
 - Freed up bed space to enable multiple SIMOPS
 - Reduced costs, risks, and NPT compared to conventional operations
- Experienced no recordable HSE issues

with the IO3 model. All personnel who remained at the rig site were multi-skilled and cross-trained to support several products and services. Experts located in a Remote Operating Center provided oversight and various levels of support for the field personnel.

One example of multi-functional cross training was the Field Professional Fluids position that made one rig worker per shift responsible for both cementing operations and drilling fluids. This cross-trained employee, along with offshore support in fluids and cement engineering, eliminated one individual from the rig per shift.

Because the incumbent drilling fluids service company already had a drilling fluids program qualified based on the operator's strict parameters, Baker Hughes and the operator had to collaborate effectively to qualify a new drilling fluids program before Baker Hughes assumed control.

By April 2021, all service transitions were executed flawlessly with minimal

impact to ongoing operations and no loss of performance or well production. The operator, Baker Hughes, and the rig contractor finalized the commercial agreement and the IO3-certified well plan was put into action.

Executing with predictable performance

The combined teams implemented the well plan and spudded the first alliance well in May 2021. Two additional wells soon followed. The integrated IO3 model leveraged the resources of all alliance members to streamline well construction and facilitate a cycle of constant learning from one well to the next to improve efficiency.

The onshore and offshore alliance companies successfully worked together as a strong, combined team, and delivered the first alliance well 7 days ahead of plan. The second well was completed three days early. The team achieved this 10-day savings

despite some severe setbacks outside the direct control of the alliance. The integrated plan bested initial expenditure benchmarks with minimal nonproductive time (NPT).

The remote operating procedures put in place reduced the POB from 75 drilling rig hands to 56. The IO3 model freed up valuable bed space on the rig, enabling the operator to conduct multiple SIMOPS and make progress towards the production goals.

A spirited, one-team approach led to the exceptional performance, leading the operator's management to comment on the great teamwork by all the involved parties.

Drawing on the lessons learned in this phase of the operation, the alliance team has already started drilling a third well, and will apply experiences gained to drive greater efficiency in the next stage, which is set to begin in early 2022.