

## Background

Aquaterra Energy were asked to complete detailed and bespoke riser analysis for a major North Sea operator to support a multiple field, subsea well, decommissioning project.

The analysis focused on identifying the risks associated with entering 21 historic wells, some of which were originally drilled in the 1980s. The analysis was used to mitigate operational risk and to support significant project cost savings. Following completion, the analysis provided our client with enough confidence to mitigate risk, and gain the necessary approvals from the HSE.

## Solution

Working closely with all parties, we started with a comprehensive review of the wells, each having a unique design and operational history. These varied from relatively modern high specification wells to historic and challenging wells dating back to the 1980s. Understanding the design and history of each well was crucial to calculating appropriate historic fatigue, which considered each historic drilling and workover operation individually. Our analysis considered the rig, metocean data, subsea trees, wellheads, subsea well design, and soil data, all of which was unique to each well and operation. As historic information can be challenging to acquire, we worked closely with the end client to fill any gaps using our extensive data library.

Once the historic fatigue on each of the subsea wells was understood, we assessed different scenarios of the P&A operations using different rigs in different seasons. Each rig and well included a comprehensive analysis covering VIV, structural envelopes and fatigue connected to the subsea well as well as riser hang-off and running envelopes to aid with operational planning. This allowed the end client to fully evaluate the full rig market and make informed decisions about the P&A requirements for each well.

As Aquaterra Energy was involved with all 21 wells, analysis efficiencies were passed back to the end client, supporting cost savings. In addition, a standardised analysis approach was consistently applied to all wells, enabling the end client to strategically plan the Plug and Abandonment (P&A) operations with uniformity. We were able to complete the analysis in parallel using our in-house bespoke software Orange.

Our analysis team, in collaboration with our in-house engineers, proactively proposed solutions such as BOP tethering to minimise loading on the subsea well, identified the optimal time of the year for operations, and provided recommendations for the rig. This was particularly important in managing risk on older wells with lower structural capacities and higher historic fatigue damages. It also provided the client with valuable information in operational planning and rig requirements.

## Results:

The analysis found that use of the planned BOP tethering system was not required for four of the wells if P&A operations occurred during the summer months. As well as simplifying operations, this provided cost saving of more than £4m when combining a typical rental cost of a BOP tethering system along with the anchor handling vessel for the installation and recovery of the system for all the wells. This also saved approximately one day of rig time for each of the four wells, bringing the total cost savings to roughly £5m in total.

The operational improvements recommended via our analysis also supported the operator with a reduction in CO<sub>2</sub>. Approximately 458 tonnes of CO<sub>2</sub>e were avoided by removing the need for an anchor handling vessel for the wells, and by avoiding one day of rig time <sup>(1,2)</sup>. By assessing seasonal conditions, the analysis further optimised the operational planning process, ensuring the right wells were abandoned at the right time of year.

### References

(1) CO<sub>2</sub>e have been calculated by referring to a typical anchor handling vessel: <https://www.dof.com/fleet/skandi-emerald>

(2) CO<sub>2</sub>e data for a rig day have been calculated using the latest emissions factors via MoreScope: <https://www.morescope.com/>

# Analysis provides cost savings of approx. £5m for decommissioning project

### Location:

North Sea

### Product:

Decom Analysis