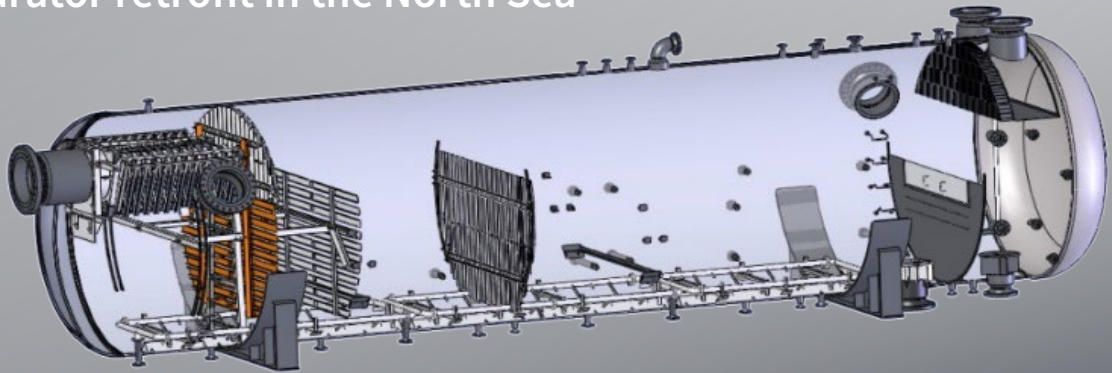


Process Upgrade

Three-phase separator retrofit in the North Sea



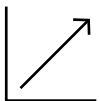
This North Sea operator requested a fluids characterization study for input into a new produced water treatment (PWT) package. Our initial analysis identified high concentrations of small oil droplets in the water outlet from the first-stage separator.

We carried out a physical modeling study to identify improvements to the internals. We proposed and supplied a full retrofit set of internals, resulting in an order-of-magnitude improvement in performance.

Additionally, retrofitting the internals saved our client more than \$2 million compared to installing a new PWT package.



Order-of-magnitude increase in both oil and water quality



Removed need for additional PWT package in the water treatment process

Project details

- **Original performance:**
25% BS&W, 1,000ppm OiW
- **Post-upgrade performance:**
2.5% BS&W, <100ppm OiW

Scope of work

- Fluids characterization study
- Detailed process review
- Design of a retrofit set of internals (verified by physical modeling)
- Fabrication, delivery, and installation of the internals
- Commissioning and optimization by the same team of specialist engineers who had carried out the review, study, and design of the solution

Key facts

- Saved more than \$2 million compared to the installation of a new PWT package
- Both the capacity and performance of the separator have considerably increased, negating the need to install an additional PWT package to meet environmental targets