

Expro Excellence

# Expro utilizes GEN III Cement Head to set offshore world record with heaviest casing string deployment

Well Construction | Cementing Technologies



## Objectives and background

- The customer approached Expro about designing a cement head to handle their heavy casing strings on an upcoming well where the strings would weigh 2.6MM with 100kip of overpull
- Expro was contacted due to the long-established relationship between the customer and reliable function and delivery of prior equipment

## Expro Excellence

- Expro's current fleet of Cement Heads supports up to 2.5MM lb. capacity with an internal pressure rating of 10,000psi. The current tool design accommodates combined loading without pressure derating due to increased tensile forces
- Expro introduced an innovative Cement Head design capable of withstanding a 3-million-pound load and a combined pressure rating of 15,000 psi. The primary challenge was achieving these enhanced specifications without altering the tool's outer or inner diameters, which were already at

their design limits. To overcome this, the engineering team implemented a series of strategic enhancements, including modifications to the proprietary Quick Lock connection to optimize load distribution, the selection of advanced materials, and comprehensive design refinements across the entire tool.

- The team employed a unique geometry and an extensive Finite Element Analysis (FEA), followed by physical validation through combined loading tests at 4.5 million pounds and internal pressures up to 22,500psi
- Strain gauges located in high stress areas were installed as well as Digital image Correlation (DIC) to validate the calculations and FEA performed during the design. The new 15ksi rating also applied to all accessories utilized with the Wireless Cement Head with SkyHook™. This required further analysis on the L.E.D., pin pullers, ball droppers and swivel
- As a result of this rigorous testing and evaluation, Expro successfully validated the 15,000psi rating and achieved a test pressure of 22,500psi

## Value to the client

- Expro delivered the only 3 million-pound, 15,000 psi-rated Cement Head on the market that maintains full pressure integrity under increasing tensile loads without requiring derating
- This innovation enabled the successful deployment of the 16.25" casing string – setting a new world record with a total hook load of 2,849 million pounds

## World first



## Innovative solution

