

## Expro Excellence

# Safe, efficient and effective wellbore plug and abandonment operations

## DST - TCP



### Customer challenges

- The main challenge our customers face today during abandonments is in finding a cost effective way to reduce risk and exposure to the environment while meeting or exceeding regulatory requirements
- Currently, there are several options to permanently plug and abandon a well depending on the needs of the well. Methods include cut and pull; section milling; cement squeeze through multiple casings (suicide squeeze); and perf-wash-and cement
  - Cutting and pulling casing can get complicated when casing is found to be corroded, damaged, or stuck in debris
  - Section milling requires cutting and milling a complete section of casing, which has increased associated HSE risk and higher cost due to additional rig time
  - Cement squeeze can be cheap and quick; however, the primary hazard can be unknown barriers between casings therefore proving difficult to verify zonal isolation
  - Perf-wash-and cement is a proven, cost effective and efficient method which allows direct pathways to each annulus over the complete targeted section to ensure the cement barrier is correctly and completely in place
- Expro was approached by a customer to discuss their upcoming Plug & Abandonment campaign in a deep-water, Gulf of Mexico location and proposed a perf-wash-and cement solution. This proposed method would provide predictable and efficient results, by running a bridge plug, electronic firing devices, large interval perforating system specifically designed for the well, and a wash and cementing tool, all in a single trip in hole
- The customer selected Expro's proposed multi-vendor solution based on their expertise in optimising perforation design and selection of charges to provide the most efficient wash in the annulus and effective cement barrier, for reliable isolation from the reservoir

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- For the perforating system, Expro commissioned a 300+ foot interval of 7" guns with specially designed Isoloc charges for the operation in a short timeframe. The perforating charges needed to be designed to penetrate the inner string of casing with a specific 0.5" entry hole at 12 shots per foot, without damaging the outer casing
- An electronic firing device was chosen to mitigate limitations with applied pressure to the annulus, and avoid compounding multiple pressure-activated devices for plug setting, gun detonation, etc. as well as avoiding requirements for fishing of mechanical drop bar, post-perforation
- Expro selected a 3rd party wash tool for the operation, which is designed to isolate the perforated interval and jet fluid into the annulus at velocities optimised to provide effective washing and lifting of debris. A clean annulus ensures an effective cement job. A robust global track record for the technology supported confidence in this proposed solution
- The conventional approach of section milling would have led to additional operational time, multiple trips in hole and a shorter cemented interval (barrier). The Expro solution lowered operator cost and total carbon output, by significantly reducing operational rig time
- Our engineered solution provided a verifiable cement barrier, extending the interval from a minimum planned mill section of 60ft to 300ft; reducing our environmental impact while exceeding BSEE requirements. This solution resulted in a reduction in rig time and less personnel exposure for the abandonment procedure, versus conventional section milling

### Value to the client

- From design, commissioning, and testing of the system, Expro was ready to run in hole within two weeks, with the first-ever deployment of this system in the Gulf of Mexico
- The customer saved more than 150 hours compared to using section milling solution
- This avoidance of milling, tripping, and cleaning operations saved an estimated \$1,250,000 to the client and presented a significant reduction of overall carbon footprint to perform the operation

### Environment



### Cost-effective



### Contact

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