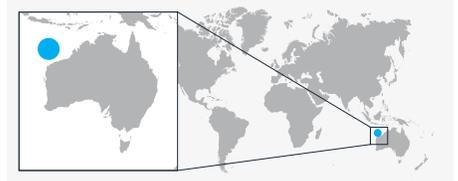


Case study: LOCK™

When exploiting your energy reserves without impacting your nature reserves you need absolute protection.

Challenge

A major international operator is involved with part of the largest natural gas projects in the world and the largest single resource development in Australia's history. The gas field is situated in an environmentally challenging area, with a history of severe tropical storms and cyclones. The area is also ecologically sensitive and includes Barrow Island, a Class A Nature Reserve. The field is situated in approximately 1,350 m of water and operations are performed using a 5th Generation ultra-deep water drill ship to execute a program of batch drilling and batch completion. In view of the above conditions, well integrity is understandably a critical element. The well suspension program requires setting of a proven gas tight plug in 13-5/8" casing section and another to be set in a deep (3500 m - 4000 m), highly deviated (up to 70 degrees) 9-5/8" casing section to ensure that integrity is maintained and the environment is protected.



Region: Western Australia
Well type: Gas development

Case benefits

- Rapid deployment enables significant time/cost saving in ultra-deep water drilling environment.
- Sealing element fully retracts even after long suspension period and enable efficient retrieval. All plugs were retrieved with sealing element in good condition - there was no drag during pulling out of hole.
- Integral ball valve enables full control of well pressures whilst maintaining complete well integrity.

Key capabilities

- ISO 14310 VO rated gas-tight seal
- 100% retrievability record and mill tested
- Easy, rapid set and retrieve
- No weight needed below to set
- Multiple sets without tripping
- Unrestricted 3 inch through bore
- Test from below and above
- Ultra-shallow, deep or horizontal set 20 m to 6550 m
- High differential pressure 3,625 psi ball valve equalisation
- Mechanically operated ball valve

Case study: LOCK™

Solution

Archer was awarded the well suspension plugs contract for the multi-well, 3 year campaign based on the performance of our LOCK series of well suspension plugs. The LOCK series provides the assurance of an absolute seal, independently certified as gas tight and qualified as VO under the ISO 14310 standard. Developed to withstand the harsh environmental conditions and stringent legislative demands of the North Sea, the LOCK series has a proven track record of over 1,300 successful deployments underpinned by an unrivalled 100% retrievability record. The 13-5/8" TIMELOCK utilized as the upper barrier is the only suspension plug in this size to come with VO ISO 14310 qualification. The 9-5/8" TIMELOCK is the operator's lower barrier of choice owing to its ability to be set under high well deviation, rapid deployment, and all-important VO ISO 14310 qualification.

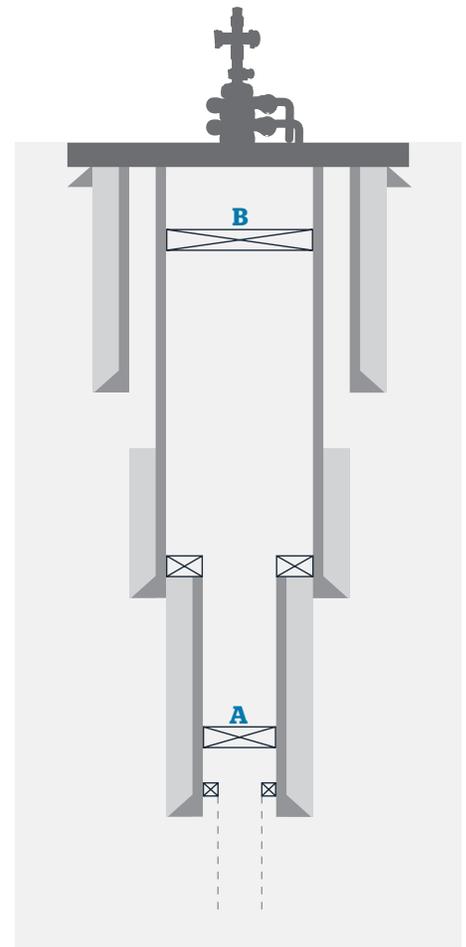
Results

All installed plugs were successfully pressure tested from above and below, enabling in-flow tests to be conducted as per the operator's stringent requirements. Furthermore, owing to LOCK's rotary locking system, the 9-5/8" plug were able to be set at optimal depths - deeper than would normally be possible using conventional technology - as no tail pipe is required.

Some of the plugs have since been retrieved - including two that were installed for over 14 months and another two that were installed for approximately 12 months. During the retrieval process, the operator was able to monitor and manage well pressure prior to un-setting the plug by functioning the ball valve.

Typical applications

- Planned temporary well suspension that requires the highest gas tight qualification - VO ISO 14310
- Storm and contingency suspension that requires high hang off weight capability without sacrificing gas tight assurance
- Leak detection - multi set in one trip and not limited by depth or well deviation
- In-flow testing while maintaining full well control capability



Typical well schematic showing placement of TIMELOCK suspension plugs:

a) Deep set 9 5/8" liner, -3000 mMD, -70 degrees deviation

b) Shallow set 13 5/8" casing, -1500 mMD, zero deviation.