

High Expansion Zonal Abandonment Solution for Extended-Reach Horizontal Well in the Middle East

Challenge:

A leading offshore operator in the Middle East required a tailored solution to shut-off an open-hole formation taking excessive fluid losses in an extended-reach horizontal well. Zonal abandonment was required to properly finalize drilling operations and commence completion activities in a safe and timely manner. The main challenges associated with this application were as follows:

- The target zone borehole inside diameter (ID) was expected to be washed out to a range as high as 16 to 20 inches.
- There were no caliper logs available for review.
- The well had an 8.6" ID restriction above the open hole section.
- Well control procedures required pump-through circulation during deployment.
- Excessive drag forces through the horizontal section prevented effective axial manipulation at setting depth.
- Conveyance through the extended-reach open hole section required the bottom hole assembly (BHA) to be rotated during deployment.

Solution:

IPI's tailored solution for this challenge was an 8" OD Permanent Inflatable Bridge Plug configured as a Cement Retainer (**PIBP-CR**). The BHA was configured with the following custom-made components in order to increase reliability:

- An 8" OD inflation element was designed and tested for the job in order to increase elastomer cross-sectional thickness and reduce the risk of potential element damage caused by frictional forces through the horizontal.
- A dual-shear sleeve sub to enable circulation, allow compatibility with a pressure-activated swivel, and obtain pressure competence for bridge plug inflation as well as hydraulic-release disconnection.
- An emergency locking valve was also included in the design as a contingency to regain pressure competence, which was required for the activation of other components across the BHA.

The PIBP-CR was deployed to setting depth and it was inflated by applied pressure. The setting sequence was finalized by the activation of a shut-in valve mechanism which permanently locked in the inflation pressure within the bridge plug. Zonal isolation across the bridge plug was obtained by activating a bi-directional dual flapper sub which was functioned by pulling an inner-stinger at the time of disconnection. IPI's DuraGRIP™ inflation element technology was used to provide leak-free bi-directional anchoring and the integrity of the shut-in valve was thoroughly tested against flow erosion based on the maximum expected flow rates and volumes prior to the job.

Results / Created Value:

The PIBP-CR was set in the horizontal section of the well and zonal losses were successfully shut-off in a single run, allowing the operator to carry on with programmed completion activities. The job was successfully executed in a safe and timely manner without operational issues, which generated substantial savings in operational costs and rig time.



Region: Middle East
Well Type: Offshore Oil Producer

Key Facts:

- Field Proven Globally
- Available for setting in Cased/ Open hole application
- Available in different sizes and configurations (to set in holes as large as 30")
- Successfully deployed offshore and onshore
- Provides axial and radial seal and anchor
- Available for HPHT applications
- Bi-directional seal with DuraGRIP technology

