Qualification of Shale as Annular Barrier in North Sea Assets

Krueckert, K., Fedorova, A.
Wintersall Dea AG, Global Well Construction, Hamburg, Germany

Content

The North Sea region has mature plays which results in a wave of well decommissioning activities for last decade. Plugging and abandonment (P&A) of wells in North Sea assets is expected to make up a major part of the overall decommissioning costs, even higher than platform removal. P&A is integral part of the life cycle for well. As responsible operator, Wintershall Dea cares about P&A liabilities and considers them timely and in sustainable manner.
P&A activities follow after the operational phase of an oil or gas well. If the bond between casing and sealing formation is not sufficient, this can typically include activities like remedial cementing, casing milling, cutting and pulling operations using a rig. These measures are time consuming and expensive. The utilization of naturally exiting shale formations as permanent annular barriers instead of artificially introduced barriers is an alternative approach which offers several benefits. P&A operations can be simplified which results in significant cost reductions. Additionally, the reduced operational complexity lowers potential risks during the P&A activities and also minimized environmental impact. Considering the big amounts of wells being candidates for using shale as barrier, potential cost savings and HSEQ benefits are enormous. However, operators have to adhere to the local regulatory framework and demonstrate that the integrity of the seal formed by the shale formation is given.
The presentation displays the assessment of shale formations as a barrier in the decommissioning of well for North Sea assets in those countries Wintershall Dea where acts as operator. It includes an overview of current regulatory frameworks in the different areas. Additionally, technologies to assess and qualify the presence of a barrier and its bond quality are presented. Together with proposed laboratory experiments these form a test protocol which aims to qualify the suitability of naturally existing shale formations as barrier in well decommissioning activities.