

An innovative concept of using strengthened scale and cement as a barrier material for well abandonment (SCBarrier)

Generation of electrochemical scale and strengthening of natural scale

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Scale formation is a significant problem for oil and gas well operations, not only during the production phase but also in the abandonment phase. To ensure long-term integrity of abandoned wells, section milling is normally required, while milling of the deposited scale and/or the steel casing underneath is time-consuming and costly. There will be huge benefits in case that the milling operation can be avoided, where scale can be left in abandoned wells and forms (a part of) the barrier material. In this connection, two feasibility studies had been conducted in the Well Abandonment (ABN) Program, one at Aalborg University (AAU) and the other at Aarhus University (AU). The promising results obtained lead to this project, i.e. investigation on an innovative concept of using scale in combination with cement to form a barrier for well abandonment. In this project, AAU will focus on studying the generation of artificial scale via electrochemical methods and the synergistic effects between the electrochemical methods and the strengthening treatments of scale, while AU will concentrate on finding effective ways to strengthen natural scale and characterizing the properties of the scale-cement composite. The outcome of this project will reveal the suitability of the concept and recommendations will be made with respect to the use of scale-cement barriers.