

Wireline Well Barrier Dissolution

Publieke samenvatting / Public summary

Aanleiding

Within the TKI Program Line Decommissioning & Abandonment innovative concepts and technology are developed to provide cost-efficient decommissioning while increasing long term safety. Engineered P&A solution are being developed using natural downhole material such as clay or salt to restore the original sealing formations. The advantage of restoring the original caprock is the long-term sealing capacities of identified low permeable and the chemically stable salt or shale formations. The basic concept is to remove the casings and cement at depths along identified ductile formation (salt, shale) and allow the formation to gradually move into the wellbore and provide a plug of natural, stable downhole material. However, this promising sealing method requires removal of the existing casing (and cement) so that the formation can “creep in”. Currently casing milling requires a very cost-intensive drill-rig operation which represents a showstopper for the development of this promising sealing options. Therefore, this study will investigate options for the dissolution of well barriers by chemical means which can be performed cost-effectively by wireline or coiled tubing.

Doelstelling

The aim of this project is to develop and demonstrate the feasibility of an innovative method to remove sections of the casing by dissolution and stimulation of natural corrosion/degradation mechanism of steel and cement disintegration which will enable economic solution for natural formation sealing.

Projectinformatie / Project information

Projectnummer / Project number

TKITOETKI2018-07-GE

Subsidiebedrag / Grant amount

€ 133.333,00

Algemene informatie / General information

Penvoerder / Secretariat

TNO

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Korte omschrijving

A selection and functional tests of promising solvents is proposed to demonstrate firstly that the dissolution time to convert and/or remove the casing material is within the operation boundary conditions and secondly that the pump conditions can be optimized to use the resistance of the solvent to flow-enhanced deterioration of key-properties of the solvent during downhole pumping. Since the applicability of the results will depend on how well they describe the actual situation in the field, the first step in the project will be to define the operational conditions and key-properties of the solvent. The second step is a literature survey on public scientific and industry data on chemical reactivity of steel and cement chemical in order to preselect the best candidates for the testing programme. With this information, the innovative concept will be specified considering possible engineering solutions and chemical compositions in compliance with ecological standards, using available test methods to determine the unknown material parameters.

Resultaat

The approach will consist of two test methods that will be designed and build in house: a coupon immersion tests and flow enhanced corrosion set-up. A test program will be set-up to address the unknown parameters relevant for the process design and to demonstrate the efficiency of the selected solvents. Preliminary tests will be done at ambient pressure and temperature. The project will yield a process-based concept design to dissolve casing and cement in accordance with environmental requirements. The feasibility of the stimulated corrosion and cement disintegration will be demonstrated by lab tests. Most promising concept designs, tailored to oil and gas, geothermal and dissolution mining requirements, will be provided which can be developed further in in-situ and/or field tests (in follow-up projects).

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

Voor meer informatie over de Topsector Energie, ga naar www.topsectorenergie.nl.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar www.rvo.nl/tse.