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A comparison of worlwide well integrity standards with focus on cement properties and lessons learned

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Abstract

Oilwell cement is considered a very important well integrity barrier, designed to support the casing and isolate various formations during the life of the well. The standard material used to cement wells is Portland cement and its derivates. This material has been used for more than 60 years in the oil and gas business. However, the complexity of the well has massively increased in the past 20 to 25 years, leading to new challenges for the well cementing.

Wellbore integrity has been intensively studied, and the major findings point to the cement structure as one of the weakest point. New materials proved to be better but they are expensive and some are not accepted by actual standards as a solution for long-term wellbore isolation. With the increasing number of abandoned wells, the search for alternative materials to classic Portland cement has been started once again.

This paper shows the outcomes of an extensive literature research of worldwide literature and standards that focus on wellbore cementing and regulate the materials and their use to specific applications. Additionally, new concepts are presented, followed by a discussion on whether the existing standards could allow the use of such materials without any modifications.