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Well integrity wireline logging importance thru the geothermal wells, a novel of past and present evaluation methods

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Nowadays the energy sector is undergoing a milestone turn into more environmentally responsible green industry to comply with ‘’net zero by 2050’’ regulations. The clear goal is to reduce the footprint of the global greenhouse gases to mitigate ongoing climate change. In this shift the geothermal energy plays an essential part by emitting significantly less harmful carbon dioxide, being more environmentally friendly than fossil fuel energy sector. Apart from the differences in the design and overall approach from the geothermal wells with respect to the Oil&Gas wells, safety and integrity is invariably the uppermost common denominator. This paper briefly describes conventional methods as well as cut-edge modern E-Line technologies for comprehensive overview of the casing and cement integrity.

Historically the integrity of wellbores was assessed based on the temperature and cement bond log (CBL) surveys run on the electric cable. An increase in the temperature data logged shortly after cementing job, as a consequence of exothermic reaction, was good indication of the TOC depth. The bond quality itself was inferred from the attenuation of the low frequency sonic signal between transmitter and 2 dedicated magnetostrictive, or later piezoelectric, receivers with 3 and 5’ span. Mechanical caliper log was run to assess condition of the inner side of the casing. These logging methods even though extremely reliable for qualitative analysis have been lacking in azimuthal sensitivity and overall resolution, that is required to get a complete picture of the wellbore conditions to successfully maintain the integrity of wells. Over the last decades developments in the E-Line technologies resulted in the broad range of the cased hole measurements portfolio offered by various service companies. Among them Weatherford offers one of the most competitive proposition on the marked called SecureView®; single-trip, high-resolution casing and cement diagnostics. SecureView® is a suite of technologies — UltraView®, CalView®, FluxView®, and BondView® that provides a complete and comprehensive picture of the downhole condition as a necessary step to plan further remediation actions. The tools can be run in tandem which significantly reduces logging time, increasing overall performance of the workover operations. By utilizing cutting edge technologies SecureView® can identify the wellbore integrity problems that conventional tools standalone cannot do.