

Demonstration of ABI92 televiewer functionality at 300 °C in borehole B-14, Bjarnarflag, Iceland

On December 15th 2009, a high temperature televiewer made by HiTI partner ALT, was successfully demonstrated at 300 °C in a hot geothermal well in Bjarnarflag, northeast Iceland, completing one of the project's deliverables, see Figure 1.

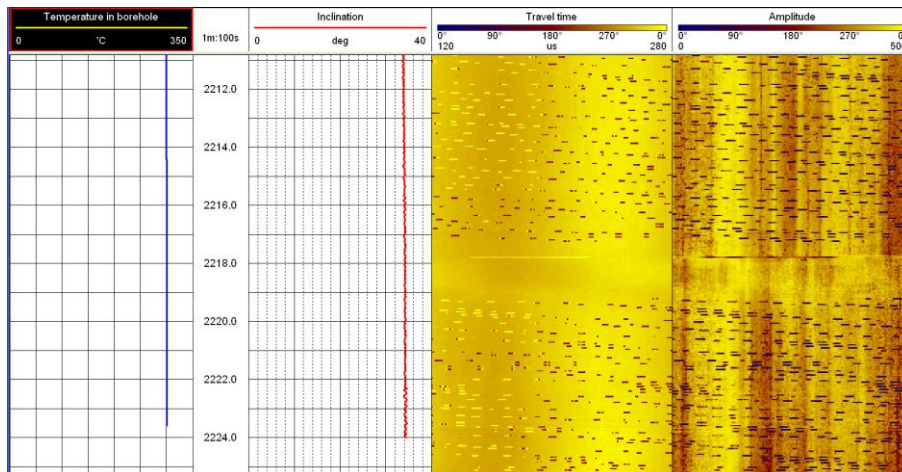


Figure 1. Temperature in the far left column is recording 300 °C over the measured section (2211-2224 m). Both travel time and amplitude show 7" liner perforation (casing holes) and a liner joint. Note the near-perfect centralization at tool inclination 34° from vertical, achieved using stiff in-line centralizers.

The advanced acoustic head used in the demonstration was Teflon coated, in order to protect the acoustic window from eventual harmful chemical conditions at the elevated temperatures. At one time during recording upwards, the rotary mirror head stopped spinning, but returned to function a few meters higher up in the well. The tool spinning creates sharp angular momentum changes, stopping the motor. A high resolution image was recorded after the motor returned to function again (Figure 2).

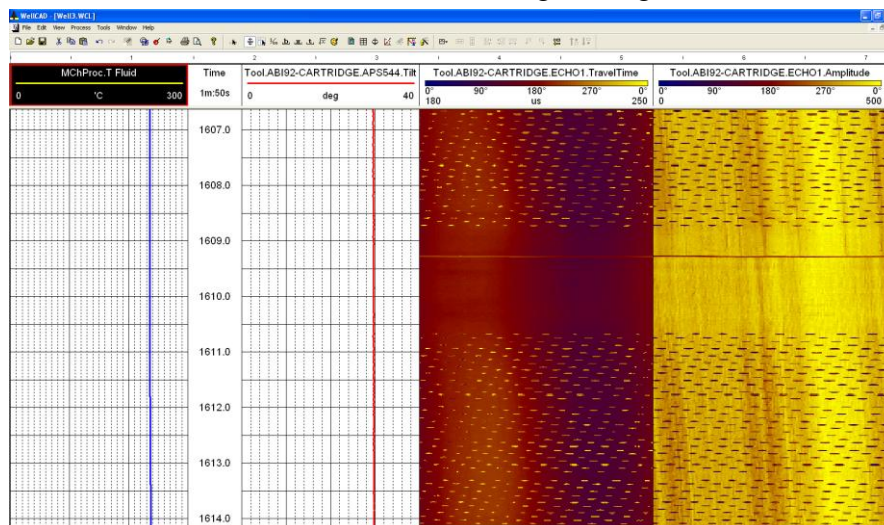


Figure 2. High resolution image of B-14 liner.

An independent evaluation of borehole temperature and pressure was achieved by ÍSOR logging instrument, a K-10 from Kuster Company, see Figure 3.

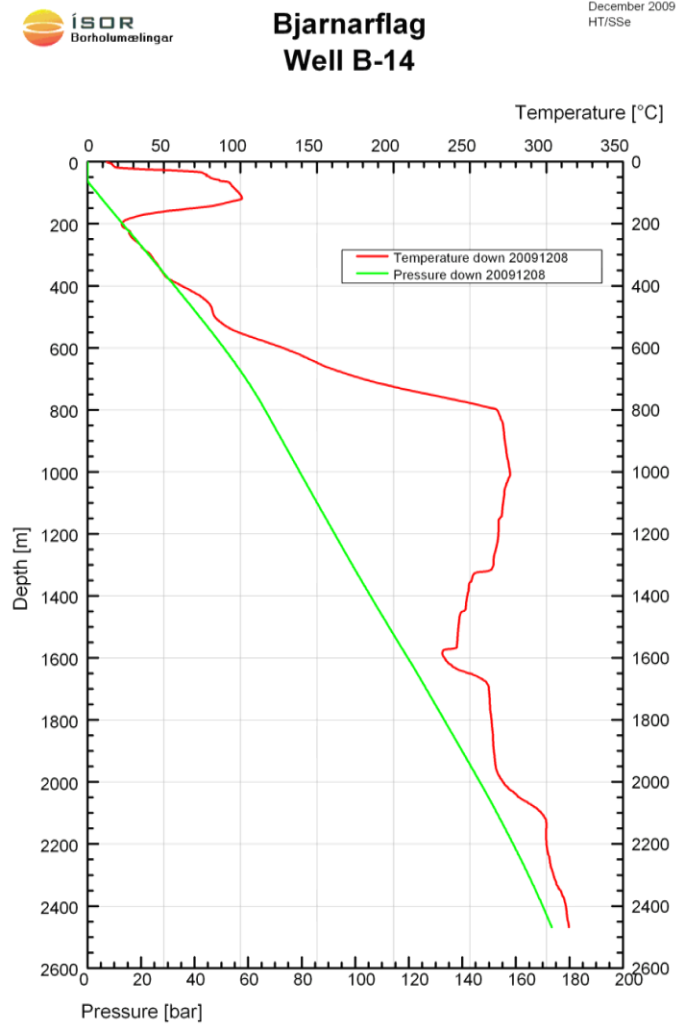


Figure 3. Temperature (red profile, top scale) and pressure (green profile, bottom scale), measured with tool going down into the B-14 well.

The logging down the well lasted 3.5 hours until 300 °C borehole temperature was reached, after which time the temperature of the heat shielded electronics had risen from the starting value of 18 °C to 29 °C (see Figure 4). On recovery from the well after a total operation time of around 7 hours, the electronics were at 43 °C. This internal electronics temperature gradient is near linear and indicates that the 125 °C tolerant electronics could last up to 30 hours at these high temperatures.

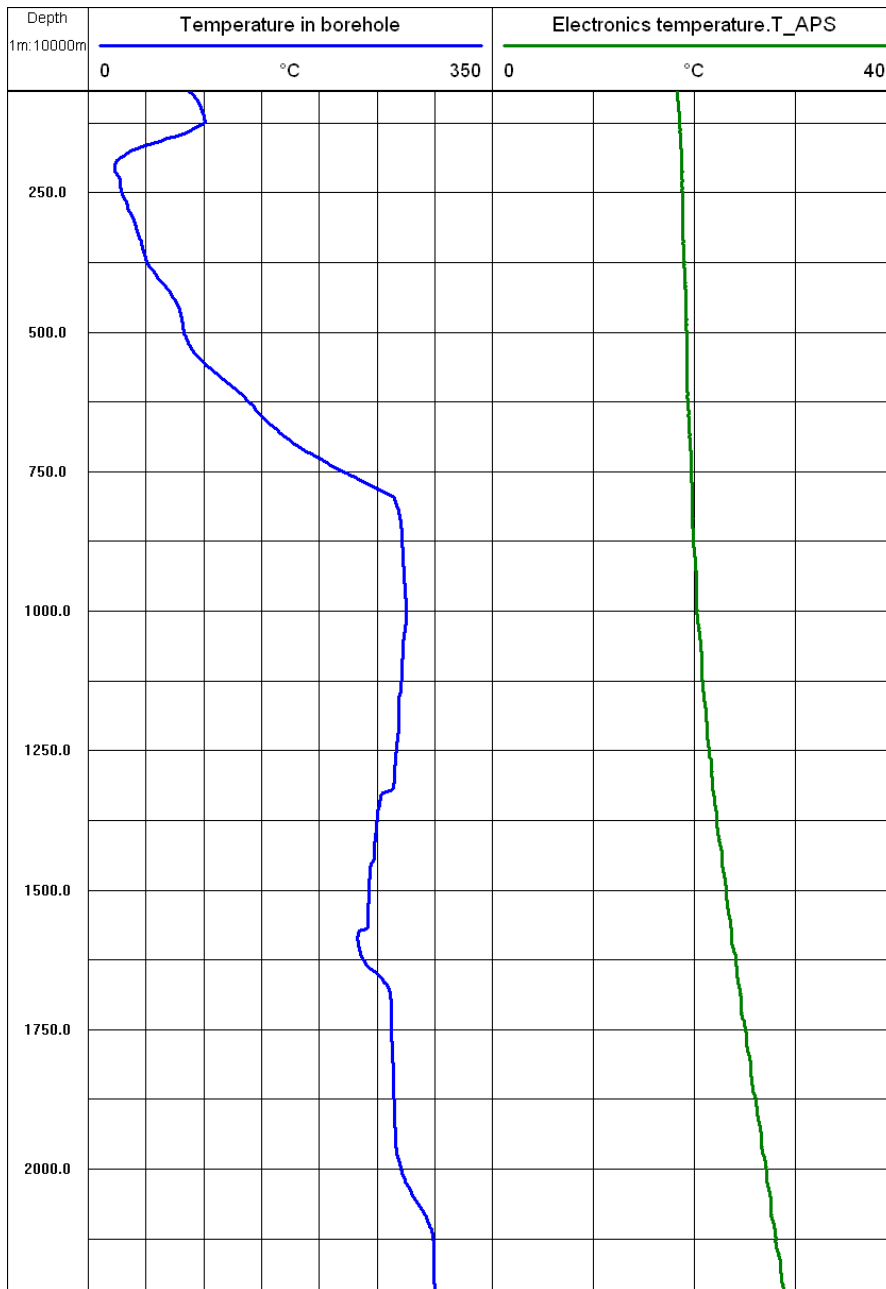


Figure 4. Well temperature and electronics temperature shown side by side.

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