



ARE YOU GONNA GO MY WAY?

Examining the Effect of Off-Azimuth Drilling and Hole Integrity

Melanie Popp, P.Eng., Senior Engineering Advisor, geoLOGIC systems ltd.

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A binary matrix grid where most values are 0s. A prominent yellow diagonal band of 1s runs from the top-left towards the bottom-right. A red curved arrow starts at the top-left corner, follows the yellow diagonal, and then curves downwards to the right, indicating a path or flow through the data.

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Most unconventional horizontal multi-stage frac wells are drilled in the direction of minimum principle stress. For the Western Canadian Sedimentary Basin, this means that most wells are drilled in the NW-SE direction, ensuring that fractures are created transversely, and not longitudinally. However, because of the grid-based land system, it is sometimes more advantageous to drill either N-S or E-W to create a situation of maximum drainage from the given section. With lateral lengths increasing, it is important to understand borehole stability to ensure that the casing is run to bottom and an adequate cement job is achieved.

The graph of time spent running casing and cementing (time code 12) vs. lateral length is shown at right. Most laterals over 3500 m are drilled NW-SE and appear to have proportionally lower casing run times than the N-S wells. In fact, the average length-normalized run time for NW-SE wells is 108 m/hr vs 82 m hr for E-W wells.

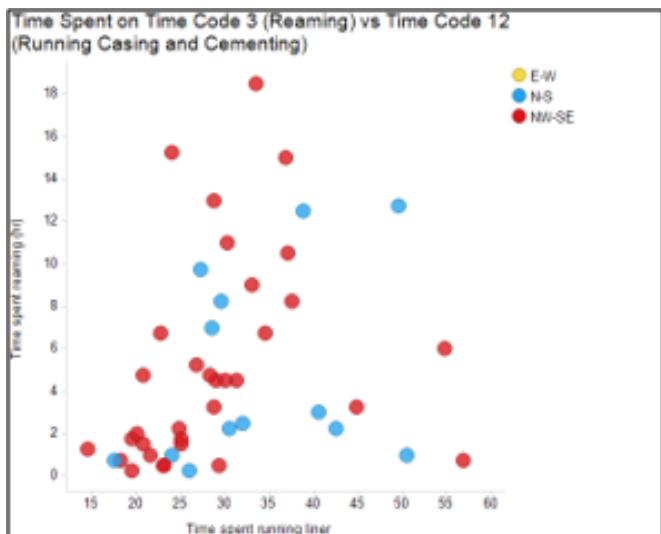
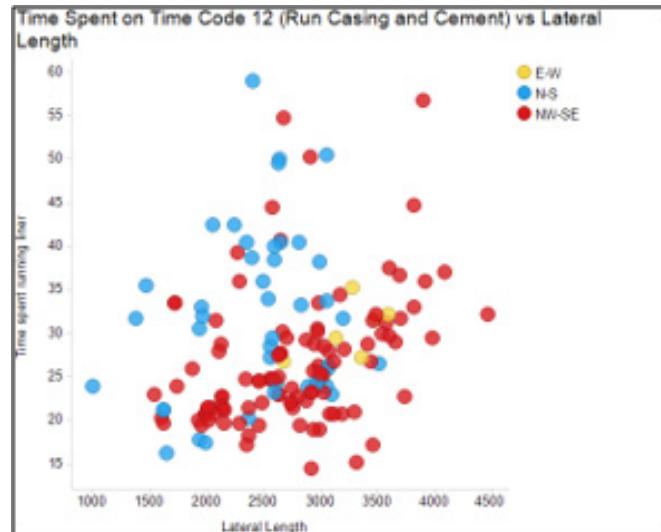
What role does hole integrity have in this case? Both the N-S and NW-SE wells reported reaming in ~33% of the wells studied (no reaming was recorded in the E-W wells).

Examining the reaming vs running scatter plot, there is a scant correlation between time spent reaming and time spent running casing which could indicate some level of hole integrity issues - although the direction of the wellbore doesn't appear to affect this relationship.

Want to perform this type of analysis in your area of interest? geoLOGIC has the most comprehensive and current drilling database in the Western Canadian Sedimentary Basin and a variety of methods to view and analyze the data. Whether it's our truly integrated datasets or our responsive customer support team, we help to inform quick and accurate decisions.

Interested in what effect azimuthal direction has on fracture pressures? Check out our article:

Taking a Turn for the Worst?



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