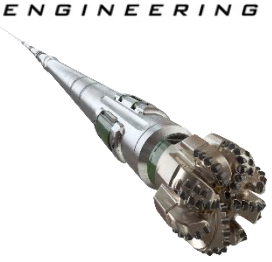
Extreme Equipment Sales & Rentals
PowerDrive - Cannot Engage GTF Below 1 degree Inclination
Revision 1.0



Date: May 22, 2019
Applicability: All PowerDrive running v3.0, v3.1, and v3.2 firmware
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Approved by: David L. Smith, NAL Reliability Manager
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Background Information

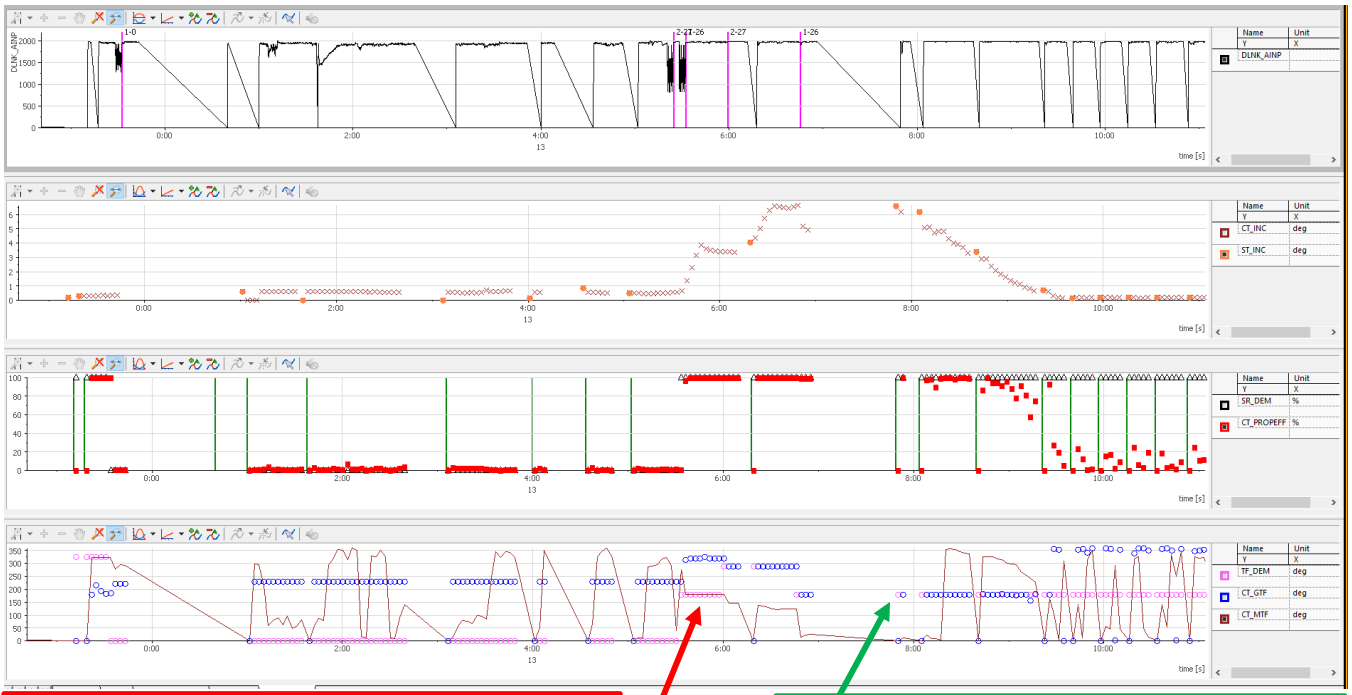
Recently, NAL experienced a situation where a PowerDrive in a vertical well section did not switch from MTF mode to GTF mode as commanded, resulting in undesired kickoff when a manual command was sent.

The PowerDrive was in an MTF 0/0% setting, with inclination under 1 degree. When the 2-27 command was sent to engage GTF, the PowerDrive recognized the command but did not switch to GTF. The rig then sent 1-26 command to engage 180°/100%, which was intended to hold vertical, but was accepted as 180°/100% MTF, causing southward kickoff.

Solution – Ensure tool is set to 0/0 GTF while tool is above 1 degree inclination

When beginning a run, if the tool is in MTF and inclination is below 1 degree, GTF will not engage. To circumvent this, either engage PowerV mode to maintain vertical, which is the preferred method to drill vertically, or position the PowerDrive within a wellbore section that has inclination above 1 degree while sending the command. This will allow the tool to switch over.

Current 3.0b80 firmware for PowerDrive contains a requirement that the tool be above 1 degree inclination to switch to GTF mode from MTF mode. This was unknown by the Sustaining and Reliability teams until this incident occurred, as MTF is usually used to kick off prior to engaging GTF. However, as in this case, it is sometimes necessary to engage GTF while the wellbore is below 1 degree to maintain vertical.



Tool in MTF mode. Downlink sent to switch to GTF (2-27) follow by 1-26 (180º/100%) the Tool face demand vs Actual TF not matching. But the TF_DEM vs CT_MTF matched. Inclination start to build.

GTF mode command was sent again (2-27) follow by 1-26 (180º/100.) The tool face demand vs actual TF now matching, and also the TF_DEM vs CT_GTF matched. Inclination start to drop.