



# WWT Non-Rotating Protectors

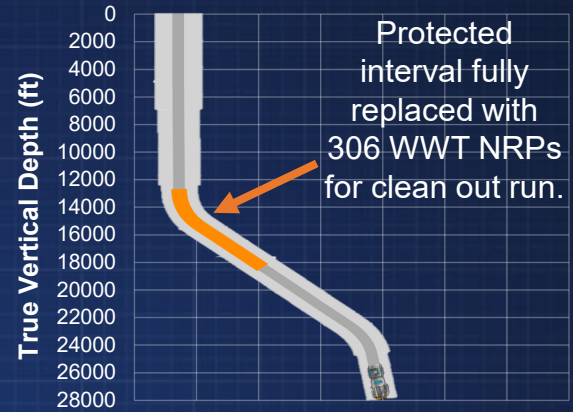
WWT NRPs Reduce String Torque  
While Mitigating Casing Wear and Heat Checking  
Case History – GOM - 10672

## WWT NRPs Reduce Drilling Torque to Stay Below Limit

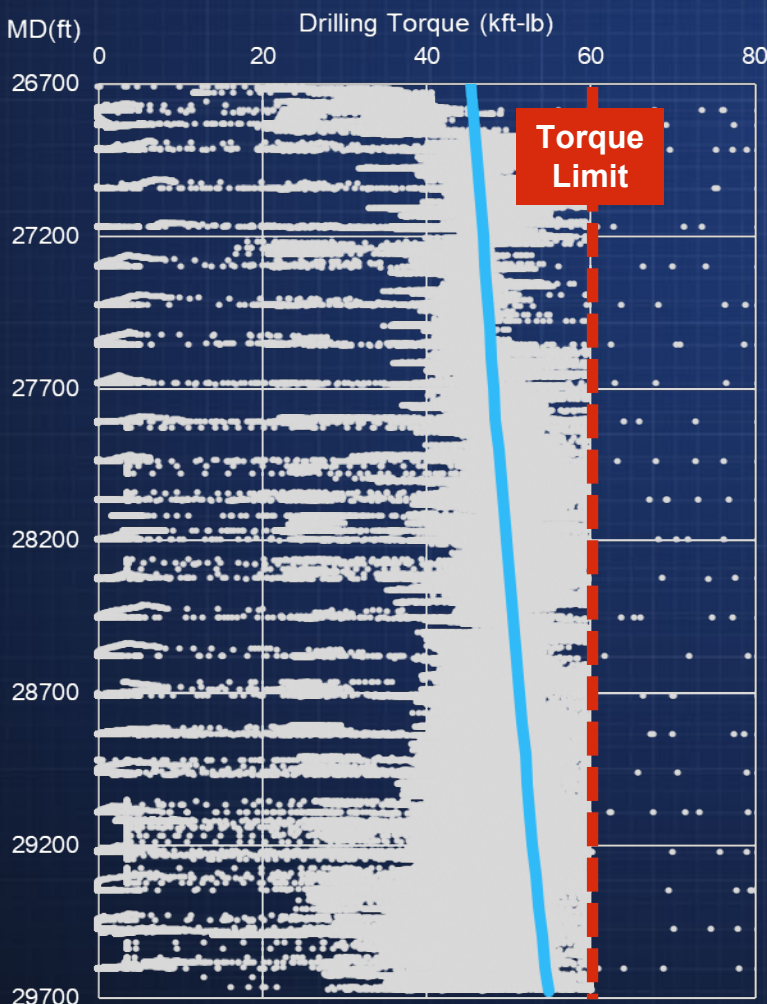
### Summary

WWT NRPs were deployed to reduce torque and prevent heat checking while drilling an S-shaped well in the Gulf of Mexico. The **14-1/2" x 16-1/2"** section was drilled without the use of WWT NRPs; only steel sub-type protectors were installed on the string. The torque limit was reached throughout drilling resulting in RPM and ROP decrease in the latter half of the section. For the **12-1/4"** section, 150 WWT NRPs were added to the drill string. NRPs provided a significant decrease in overall torque and torque fluctuations when compared to the previous section of the well that was drilled with only steel sub-type protectors. The steel protectors were removed and WWT NRPs were solely used for the subsequent clean out and displacement runs.

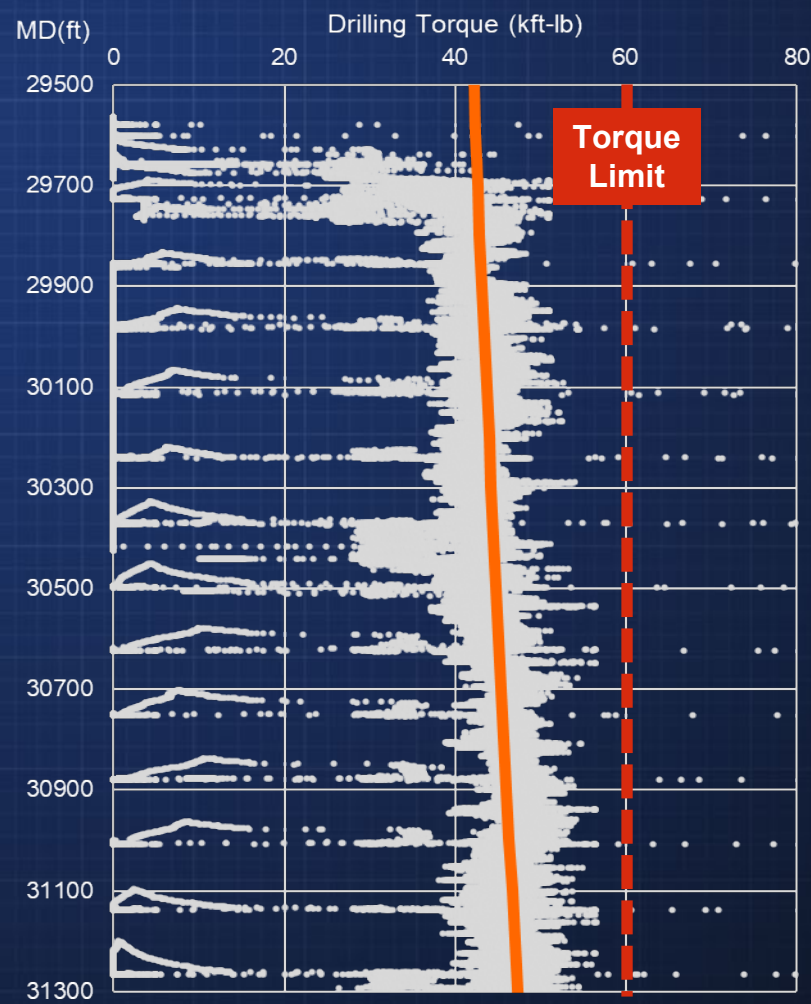
Well Shape w/ NRP Coverage



### 14-1/2" x 16-1/2" Section



### 12-1/4" Section



- Steel Subs Only

• Actual Torque

- WWT NRP Upgrade