



- **LOCATION:** Middle East
- **WELL TYPE:** Build-and-Hold Directional
- **OBJECTIVE:** Torque Reduction
- **SOLUTION:** WWT SS3-500 NRPs
- **RESULTS:** 18% Torque Reduction

Executive Summary

- An operator experienced high torque while drilling the 8-1/2" section of a 4km build-and-hold directional well. WWT performed torque and drag analysis to identify the major side force areas and decide the optimum placement for WWT Non-Rotating Protectors (NRPs).

Results

- 144 NRPs model SS3 were installed in the build section with the goal of substantial torque reduction by covering the high side force area. The shaded orange area in the projected vertical section plot represents the NRP placement at TD.
- NRPs were installed at 3,968m as per WWT's engineering recommendation. 7kN.m reduction in torque was observed directly after installing the NRPs. Before using NRPs, the torque trend was following the simulated torque for 0.35/0.40 friction factors for cased hole and open hole, respectively. After installing the NRPs, the torque significantly reduced and started to follow the simulated torque for 0.28/0.33 friction factors for cased hole and open hole, respectively. At TD, NRPs covered from surface to 1,360m resulting in an average torque of 35kN.m, equivalent to 18% torque reduction.

