

# Proven Drillability of WWT NRPs: Full-Scale Testing

## Introduction

With more than 7,000 wells successfully drilled using WWT Non-Rotating Protectors (NRPs), the recorded lost-in-hole rate is less than 0.2%. While the loss of a NRP in the wellbore is an extremely rare occurrence, WWT conducted full-scale drillability testing to verify that NRPs can be safely drilled through should such an event occur. The tests were performed on a dedicated test rig using S4-400-Slim-RS and SS3-400-Slim NRPs installed inside 10-3/4 in. casing.

## Test Setup and Drilling Performance

A 6-1/8" open-hole was simulated by cementing and then drilling the cement with a 6-1/8" bit. Each NRP and 4" slim collar were then dropped into the hole and drilled using water only. Cement was drilled at an average ROP of 60 ft/hr, while a controlled ROP of 50 ft/hr was maintained when drilling the NRPs. Torque remained consistent in all drilling runs, averaging 3,000–3,500 ft-lb. Some bit cutter wear was observed, which would likely be further reduced when using conventional drilling mud.

## Results and Conclusion

The results were successful for both NRP models. The NRPs were drilled without issue, and torque stabilized after drilling. The testing, together with 37+ years of field experience, confirms that WWT NRPs are fully drillable. No well has ever been abandoned due to NRP failure.



Illustration of  
the S4-400-  
slim-RS and 4"  
slim collar  
inside the hole



SS3-400-slim and 4" slim collar being  
thrown in the well



S4-400-slim-RS debris recovered on  
shakers