

# Expro Excellence

## HI TOOL™ tackles lateral and torsional vibrations in problematic slim-hole underreaming application

### Well Construction | Drilling Technologies



#### Objectives and background

- Expro was contacted by Schlumberger (SLB) Australia to support their current project with a customer where they provided directional drilling services
- The customer was experiencing severe vibrations in the two wells in the same sections where underreamers were utilized for small ratio hole opening (6" x 6-3/4" and 6" x 7")
- The vibration dynamics generated by having multiple cutting structures in the BHA, hampers drilling performance; reduced rate of penetration and footage drilled while negatively affecting BHA durability
- Expro's Harmonic Isolation Tool (HI TOOL™) has a good track record performance in country in mitigating vibration in multiple BHA applications

#### Expro Excellence

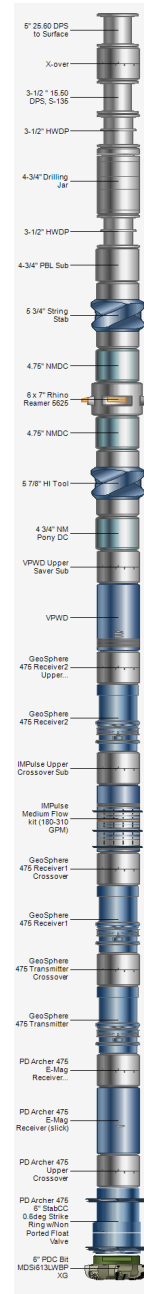
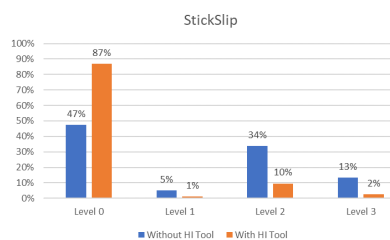
- Expro's patented HI TOOL™ has been designed to dampen detrimental vibrations. The tool's elastomeric "Anti-Vibration Rings" and spherical geared connection allows for minute flex / tilt to occur between the axis of the upper body and lower body which helps to dampen and decouple the BHA without having any manipulation towards drilling input energy. As a result, vibration generated by drill bit, underreamer, and bottom hole assembly are minimally transmitted along the string and drill strings dynamics can be improved allowing better drilling performance
- One of the main challenges of this project was the relatively long 2,013m lateral drilling and under reaming section with the Rotary Steerable BHA
- If Expro did not provide a solution there would have been premature damage in drill bit and underreamer cutting structure, potential BHA failure, shorter footage and/or slower drilling penetration rate

#### Value to the client

- This vibration mitigation allowed for improved drilling efficiency for the customer, giving drilling stabilization
- Drilling assembly can concentrate more of its input energy into penetrating the rock as less energy is lost due to instability, vibration, and negative drilling dynamics
- Expro drilled 2,013m of larger opening ratio from 2,000mMD to 4,013mMD, double the meterage of the offset well, over 93.5hrs drilling hours with good ROP 23.4m/hr. while significantly mitigating stick-slip

#### Stand out performance

- Without HI TOOL™ Stick-slip
  - Level-0 = 47%,
  - Level-1 = 5%
  - Level-2 = 34%
  - Level-3 = 13%
- With HI TOOL™ Stick-slip
  - Level-0 = 87%,
  - Level-1 = 1%
  - Level-2 = 10%
  - Level-3 = 2%
- Expro's HI TOOL™ was able to scale down Stick-slip Levels 1, 2 and 3, while significantly reducing Stick-slip more into Level 0



**Increased productivity**

**Reduction of rig time**

**Cost effective**

**Contact**

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