Expro Excellence

# CBI™ Tool enhances hole cleaning and ECD management in North Sea

## Well Construction | Drilling Technologies

### Objectives and background

- A North Sea operator sought a solution to remove excessive accumulation of cuttings and manage equivalent circulation density (ECD) in a high angle 17 1/2" section of a well where the formations are renowned to be unstable. The initial build up was to be performed in the 24" section in the Nordland Group where the angle was to be built up to over 35° and the 20" casing was to be set at 759m MD. Along the consecutive 17 1/2" section, the build up was to be continued to a sail angle of 67.8° over the Utsira and Skade formations. Section TD was planned at 2050m MD in the Undifferentiated Hordaland. Offset wells have posed serious problems with wellbore instability and consequential hole cleaning issues

### Expro Excellence

- Based on the unstable formations in the area and high hole angle requirement of over 35°, Expro's recommended to install the 5 7/8" series CBI™ Cutting Bed Impellers in the 17 1/2" section. The CBI™ tool is a downhole drill string tool used in deviated wells where excessive buildup of cuttings causes drilling issues, typically in hole angles greater than 30°. The solution included spacing of one tool per two stands made up to the 5 7/8" drill pipe, covering a total length of 1351 meters

### Value to the client

- The hydraulic and mechanical dual acting mechanism in the CBI™ tool removed cutting beds efficiently inside the casing and in the open hole without distressing the unstable formation. Its specialized design allows for easy removal of cuttings that tend to settle out of the mud in high-angle sections of the wellbore. Drilling the 17 1/2" section using Expro's CBI™ tool showed a trend on both pick-up and slack-off weights, which followed a friction factor of 0.16—nearly matching the predicted factor of 0.15. The application of the CBI™ tool in this case also improved ECD control and helped ease tripping and the subsequent 13 3/8" casing run, resulting in reduced non productive time (NPT)

Safety

Time saving



Drag Map : Pick-up / Slack-off & Rotating Weights (Ton)

String: 17½" RSS-BHA on 5⅞" DP-VX57

Hole: 20" Casing to 762 mMD.
17½" Hole to 1950 mMD
(Plan: 16/1-A-1 be, Rev 3.0)

20" Csg shoe

PUFF = 0.1 (Ton)
PUFF = 0.29 (Ton)
SOFF = 0.16 (Ton)
SOFF = 0.35 (Ton)
PUFF = 0.16 (Ton)
PUFF = 0.35 (Ton)
SOFF = 0.23 (Ton)
Planned (CBI) SO (Ton)
PUFF = 0.23 (Ton)
SOFF = 0.1 (Ton)
SOFF = 0.29 (Ton)
Planned (CBI) RT (Ton)



Wellbore departure (m)

5⅞" DP to surface ≈ 720m
35° excess point @ ≈ 720 mMD
20" Casing @ 782 mMD
Tangent ≈ 68°
1351m 5⅞" DP & Top HWDP w/ CBI's
BHA
17½" section TD @ 2048 mMD