Preparing for Surprises - Experiences from Tapti Plug and Abandonment Campaign

OISD Seminar on

“Asset Integrity and Safety in E&P”

4th – 5th December 2017, Noida, India

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Topics for Discussion

• Tapti Field Overview
• Well Abandonment Complexity Assessment (WACA).
• Diagnostics and Well Preparation Activity
• HSSE Aspects
• Field Experience: Use of Mechanical Cutters for Conductor and Surface casing.
Tapti Field Overview

- Located 160 kms NW of Mumbai.
- Water Depth ranging from 20 m to 40 m.
- 4 Wellhead platforms in South Tapti and 1 Wellhead platform in Mid-Tapti.
- Cessation of Production was declared in March 2016.
- All 38 wells on the 5 WH platforms to be Plugged and Abandoned.
Well Abandonment Complexities Assessment

- Well category – whether Land, Platform, Subsea, MLS
- Assessment done for each P&A phase
  - Reservoir Abandonment
  - Intermediate Abandonment
  - Wellhead and Conductor Removal
- Well Abandonment Complexities Assessment
  - No work required
  - Simple Rig-less
  - Complex Rig-less
  - Simple Rig Based
  - Complex Rig Based
- WACA is one of the tool to provide the guidance whether any of the P&A can be done Rig-less or require a Rig.
- WACA will provide the basis for identifying P&A method and scheduling.
Well Preparatory / Diagnostics Activity

• **Objectives:** Early assessment of the condition of wells and Prepare for P&A

• **Scope of Work:**
  - Assessment on the well integrity parameters
    - WH Seals, WH SOV and Tree valves, Annulus Pressure Test, Tubing-Annulus Communication, Annulus Integrity, Packer Integrity
  - Identify whether any well will require any special procedure for P&A
  - Requirement for dispensation to company internal standards, if any.
  - Inputs to the WACA analysis
  - Identify Dump Well
  - Update well status
  - Prepare wells for P&A campaign – saving on rig time
    - Complete the Well Integrity Checks
    - Prove access to the well bore
    - Kill Well
    - Set Deep-set Mechanical Plug and Shallow Plug
Well Preparatory / Diagnostics Activity

• Resources
  • Slick-line Units
  • Pumping Package
  • Vessel Support
  • Logistic support

• Challenges During Execution
  • Logistics, Emergency Response, communication, surprises in the wells, references to old downhole completion tools.
  • Decide how to set plugs – whether for rig-less or rig based P&A

• Timing:
  • How far ahead of the Cessation of Production or the P&A campaign
HSSE Aspects

• Emergency Response and Safety Systems on the non-producing platforms.
  • Limited or no oversight as no more production from the platform.
  • Gas detection system.
  • Life Saving and Fire Fighting Appliances.
  • Structural Integrity / Asset Integrity issue.
  • Emergency Response Plans modified for the changed situations.
  • Some of the Projects / Operations responsibilities supported by Wells P&A team.
  • Requirement to plan resources and schedules well in advance.

• Surprises from the well
• Barrier Management
• Crew Training
• Early Planning and Preparation
Cutting Conductor & Surface Casing

- Internal combination mechanical cutters is used to cut surface casing and conductor together 5m below the seabed.
Challenges during Conductor Cutting

- Unable to retract the cutters during/after use.
- Tool stuck even if the cut is successful.
- Parted casings
- High vibrations while cutting
- Knives breaking off after cutting the string due to weight of the string on the knives
Parted Conductor

• In one case, 13⅜” casing between 49 m to 63m parted and fell down in the well preventing lowering of any tool.

• The casing at surface had to be milled out to gain access to the loose piece.
Alternate Cutting Methods Explored

- Abrasive jet cutters
  - High pressure (10K - 15K psi) pumping involved.
  - Can cut through multiple conductor and casing strings even with cement in between.
- HSSE concern - pressure hazards.
- Limited tools in the market. Early commitment required.

Alternate Cutting Methods Explored

• Laser Cutting Technology
  • Sever multiple strings of casing, Full, partially, and/or void of grouted annulus
  • Deployable from a rig, rig less, or LWIV
  • Can work upto 400’ water depth
  • Downhole Real-time Tool Diagnostics.
  • Limited tools in the market. Early commitment required.
Q & A