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Agenda

• Integrated Operation – Case History
• Collaboration Well Planning improvement processes
  – 3D Windows platform integration
  – 3D Visualization Work Flows
  – AssetView™ – DecisionSpace® Software
  – Well Planning tools
• Collaborative Well Planning desktop
• Delivery & Challenges
• Connecting G&G and Drilling : Added value
• Discussion
Case History – Integrated Operation Initiative

- **IO is enabled by consistent use of real time data, collaborative technologies, and multi-discipline work flows**
- The Ekofisk field is hosting many application to face the subsidence effect of the reservoir:
  - Deployment of 3D Visualization platform to enhance drilling NPT.
  - Improve G&G and Drilling performance
Improving the Well Planning Process

Process #1 – Identify the tools used to do the work: Windows Platform as a common platform for G&G and Drilling
Oracle Client: Problematic issues

Oracle Client installation must comply with the original Oracle version in the Windows machine.
OpenWorks® Software : 2003.12.1

Need to pick up the right version of OpenWorks® 2003.12.1 software – Oracle9i compatibility.
Hummingbird® Exceed 9i

- Box from Linux to Windows
- Need a license per user.
Windows Platform : Oracle Challenges

- Oracle 10g: How to Deal with different version?
- Oracle Client 9
Improving the Well Planning Process

Process #2 – Identify the work flows.
Collaborative Wellbore Design Workflow

1. Identify Well Location & Targets
2. Design Well Path
3. Review Well Path w/ Finding
4. Generate PP, FG & Temp Information
5. Engineering Review of Gradients
6. Results Approved
7. Load Gradients in OpenWorks
8. Design Casing
9. Design Approval
10. Initialize Design Well in OpenWorks
11. Go To Drilling Design Process

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CWP – Application Data Flow

Oracle

UWI

Seismic

Earth Model

Reservoir

Decision Space - Asset View

Drilling Applications

Well Path

Casing Point

Casing Design

TSA

Torque & Drag

Database Storage

DW Oracle DB

EDM Local DB

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• Identify the tools used to do the work.
3D Visualization Workflows

[Diagram showing workflow involving TracPlanner, EDM, ODC, Visualization Room, OpenWire, and Log (WITSML) with various tools and processes connected.]
The Well Planning Process : Consolidation

Process #3 : Bridg Unix and Windows
Windows – Linux Environment

• Petrel® connected through WITSML
• Transfer of data between applications achieved primarily via flat file transfer in Petrel®
Windows Interaction with Linux – Enhancement

3D Visualization Environment & DecisionSpace® Workflows

- Petrel®
- Linux Apps
- DecisionSpace® Windows
- EDT – EDM

Flat files on local drives or network

- Multi User Oracle DB
- 3rd Party Drilling Reporting
- Local single User DB

- DecisionSpace® AssetView applications connected to Oracle DB
AssetView™, the 3D viewer

- All subsurface and drilling data can be viewed in depth and time simultaneously and updated in real-time
TracPlanner™ software

- Well planning plug-in for AssetView application.
- Create targets visually
- Define & display trajectory constraints
- Wellpath planning in the earth model.
AssetPlanner™ application

- Automatically generate targets using Seismic or reservoir model parameters
- Use filters to specify constraints on where the targets will be created e.g. depth range, porosity, permeability.
Well Planning Tools

- Create hazards from seismic volumes
- Create hazards from faults
- Create hazards from 3D Grids
- Targets can be defined as hazards *(anti-targets to avoid)*

- Generate intercept details of objects along the wellbore; formation tops, faults etc.
  - Dynamic lithology column creation workflow

- Wellbore Analyzer can extract the along-wellbore intersection of a well with any 3D data block and display these as ‘lathes’, traces or tabulated values.
  - Pore pressure & fracture gradient creation workflow

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Improving the Well Planning Process

Process #4 – Delivery & Challenges.
Summary

- Easy access to windows users
- Adapt G&G and Drilling groups
- High Visualization capabilities for drilling
- Demystify the G&G world for drillers
- Knowledge transfer between G&G and Drilling
- Culture change and Team work space
"Whoever admits that he is too busy to improve his methods has acknowledged himself to be at the end of his rope."
- J. Ogden Armour
Acknowledgments

The authors would like to express their sincere gratitude and appreciation to everyone involved in the subject project with:

ConocoPhillips Norway
Landmark Graphics As  Halliburton– Norway

We also thank management for allowing us to publish this paper.