Well Data Management and Petrophysics Workflows and Standards

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Introduction

Work-data flows

- Exploration department (illustrated today)
  - cooperation with E&P Application and Data Management department (E&P ADM) especially focused on input data organization for PPs (coordination of requests; download of Diskos data, or from ftp sites; preparation of restricted folder; etc.)
  - E&P ADM delivers Petrophysicist (PP) output by loading data in Recall, Petrel, GeoFrame

- Development/producing assets
  - much less interaction with E&P ADM
  - Petrophysical data are requested, shared and handled inside the asset group
  - E&P ADM is needed at the end of critical phases (track working/reference projects when crossing decision gates or model reviews)

- In drilling campaigns cooperation with E&P ADM is important to make sure well data are handled and archived properly. This includes delivery of final data/reports to authorities and partners; storage of physical items like final reports but also cores, cuttings, fluid samples, etc.

- Shortcut (!)
Introduction

Standards

- Data have standardized units, colour coding and display formats (logs, CPIs, cores, mud log gas readings, shows, etc.)
- Petrophysical methodologies – periodically discussed in petrophysicists network meetings (not part of this presentation)
- Standards are collected and reported in DONG ENERGY internal web portal Navigator and they are re-discussed when needed
Well Data for Exploration Workflow

Exploration requests well data

1) Data Management Service Request
   - Request Number:
   - Request Date: 14 November 2013
   - Contact Information
     - Requested By: Site K. Marker
     - E-mail Address: bikms@dongenergy.dk
     - Phone Number: +4599933183
     - Location: GIF

2) E&P ADM
   - Well header
   - Deviation survey
   - Checkshot & Cal_time_depth

3) CC

4) Petrophysicist
   - Composite
   - CPI
   - Geophysical etc

5) E&P ADM

6) Petrel

7) Mail to requester
   - Data loaded

8) Recall

9) GeoFrame

10) DONG energy
Well Data for Exploration 
Data Management Service Request

Well Data Types to load:
- New Well (Headerinfo)
- Geophysical
- Deviation Survey
- Composite
- Fluid Substitution
- CPI
- Core Plugs
- CAL_TIME_DEPTH
- Whole Core
- Sidewall Core Plugs
- CPI PN
- DST
- Markers
- Show
- perf
- Res_Dep
- Res_Med
- Res_sha
- Ac_Comp
- Ac_Shear
- ...

Recall not DONG QC'ed Data Types:
- Composite Diskos
- Geophysical Diskos

Data Management
Typical timing:
1-3 days per well

Petrophysics
Request forwarded for evaluation.
Typical timing:
COMPOSITE: (1 hr - 1 day per well)
CPI: (1 – 4 days per well)
FLUID SUB: (5+ days per well)

Non-routine
Can be created if necessary.

Recommendations:
1. Always discuss with the Petrophysicist objectives and timeline.
2. Go back to both the assigned PP and the assigned DM if priority has changed or anything is not important anymore.
Data Management Services
Well Data Standards – Folder Structure

Folder rules for confidential data in the purple folders and underneath: Data shall be stored with the projects until they are “openly” available.

Level 1 & 2
DM is the owner.
It's only DM upon request there are allowed to ask IT to create new folders and which groups should have access.

Projects:
Level 3 & 4
DM: Full control
E&P: Access set by DM.
It's only DM who have to create folders.

Blue level 3 & 4
E&P: Read only

Well Data:
Purple
Confidential data:
The team: Full control
Other E&P: No access

Green
E&P: Full control - But it's only advised that DM put data into GEUS, CDA, DISKOS or similar and DONG_PETROPHYSICS

Folder structure on I:\
Data Management Services
Well Data Standards

What to be found on Well Data

- Naming and writing rules for wells in DONG ENERGY - Full version in Navigator (22877)
- Well attributes for header information in Recall, Petrel and GeoFrame
- Naming of log curves for DONG ENERGY own interpretations - Mnemonics - Full version in Navigator (22872)
- Naming of well picks and markers - Navigator (39284)
- Which data to be found in Recall, Petrel and GeoFrame
  - Spreadsheet overview for each UTM zone in each country
- How to connect and download from Recall
## Data Management Services
### Well Data Standards - Log Curves Mnemonics

<table>
<thead>
<tr>
<th>mnemonics</th>
<th>DONG Standard for own interpreted logs</th>
<th>Curve Description</th>
<th>Business</th>
<th>Property Type</th>
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Data Management Services
Well Data Standards – Stratigraphy, Well Picks and Markers

- Chronostratigraphy in DONG ENERGY follows the work of the International Commission on Stratigraphy ICS
- Lithostratigraphy in DONG ENERGY
  - Ongoing project to establish official Corporate standard Lithostratigraphy Charts for footprint Areas/Basins
Data Management Services

Procedures on Definition of Standards

Procedures

- Well Naming Standard
- Well Marker Standard
- Mnemonics to be Used for Log Interpretation and how to define new
- Naming and how to load CHEKSHOTS, CAL_TIME DEPTH and the GEOPHYSICAL log
- Receiving new DONG Operated Seismic and Well Data - Norway
- Receiving non-operated Well and Seismic Data - Norway

Operations Geologist receives preliminary log data and puts them on the I-drive in the respectively well folder under another folder called Preliminary data and inform team.

Operations Geologist receives final log data from the contractor on paper and CD for QC. Data QC is performed by Petrophysicist. Other QC e.g. heading info is done by Operations Geologist.

If OK. Operations Geologist orders X number of paper copies and CD’s for distribution. If not OK. Operations Geologist sends it back for correction.

Petrophysicist puts the final log data into the well folder (I-drive) under a folder called Final data and informs team and EPIT about it.

Operations Geologist registers all final documents in the ‘report and data tracker sheet’.

Operations Geologist delivers the data to the EPIT - document administrator, for registration and distribution to partners and Logtek.

Document Administrator registers the original data in ProArc and Lyne and archives the physical items.

Document Administrator distributes to petrophysicist, partners and Logtek.

Logtek prepare the data for reporting to DISKOS and send it to petrophysicist for approval.

Well Administrator to follow up data & document the ‘Report and Data Tracker sheet’.

Well Administrator load data into Recall as described in Recall procedure.
# Data Management Services

## Overview of Available Data in Recall, Petrel and GeoFrame

<table>
<thead>
<tr>
<th>WELLNAME</th>
<th>DEV SURV</th>
<th>WELLPATH</th>
<th>FINAL CHECKIN</th>
<th>FINAL CAL/TIME DEPTH</th>
<th>COMPOSITE</th>
<th>CPI</th>
<th>CPI PDF</th>
<th>GEO PHYSICAL</th>
<th>FLUID SUBSTITUTION</th>
<th>CORE PLUGS</th>
<th>MINIFERM</th>
<th>WHOLE CORE</th>
<th>SIDEWALL COREPLUGS</th>
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<td>D</td>
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<td>Ex</td>
<td>11-Oct-12</td>
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**Legend:**
- D: Dong G-Cut/Interpretation
- Ex: External data

**Current date:** 28/04/2014

**Petrel reference project:** NO_Ref_UTM31_Wells.pet

**GeoFrame master project:** WM_NO31
Acknowledgments

Special thanks to Birte Marker, Siw Jonassen, Mevan Kumar Ranasinghe, Lotte Puk Jensen, Niels Christian van Gilse who actively work in maintaining and creating good standards and to the other members of the DONG ENERGY Petrophysics network for their constant support.