Petroleum Data Management in Norway - The National Data Repository - Diskos

IOGP Geomatics / Statoil

Industry Day 2017
Stavanger 26th April

Eric Toogood, Diskos Manager NPD
50 years ....
National responsibility for data

• The NPD has a national responsibility for data from the Norwegian continental shelf.

• The Norwegian authorities’ strategy
  • Co-operative solutions for efficient data management
  • Common standards for data transmission and storage

• The NPD is on behalf of the Norwegian State entitled to all information the oil and seismic companies have regarding their activity on the Norwegian Continental Shelf

• The NPD has a long-term goal of taking a national responsibility to ensure that data and information from the petroleum activities are made available to all interested parties

• The NPD’s data, overview and analyses constitute a crucial factual basis on which the activities are founded.
Main roles of the NPD

- **MPE**
  - Advisor
- **OTHER GOVERNMENT AGENCY**
  - Promotor
    - Sector authority
- **INDUSTRY**
  - Overview
    - Facts
    - Communicate facts
  - Promotor
  - Follow-up
    - Exercising authority
- **COMMUNITY**
  - Communicate facts
- **Data**
Data legislation
Data Reporting to the NPD

• NPD is entitled to all information the oil companies have regarding their activity in Norway.
• The Norwegian Petroleum Act allows NPD to formulate detailed routines for reporting.
• NPD has observer status in all licence committees.
• NPD gives drilling permission.
• NPD gives permission to perform all seismic surveys.
Petroleum Legislation Structure

- Acts
- Regulations stipulated as Royal Decrees or by Ministry
- Regulations stipulated by NPD
- Guidelines
The Petroleum Act 29 November 1996

(revision of previous legislation)

The Legislation:

• § 10-4 Material and information concerning the petroleum activities
  • Outlines the framework for reporting to the authorities
  • Legislation applies to anyone generating information regarding petroleum activity
  • The Licence operator has a special responsibility for data
  • Material and information shall be submitted to the Ministry or to anyone designated by the Ministry
  • Currently – CGG
Data Ownership in Norway

• Data is owned by the company that pays for its initial acquisition and thus has the “copyright” or intellectual property rights
  • oil company (private or state owned)
  • licence group
  • spec company
  • NPD

• Data may be purchased – User Rights or Owner Rights
  • User entitlements to the data can be easily changed

• Data may be traded – User Rights only
  • Data may by traded
  • Managed by The Norwegian Oil and Gas Association
Data confidentiality

Regulations to Act relating to petroleum activities
Section 85. Procedures and duty of secrecy

• Release of seismic data/well data
  • Licence data is confidential for 2 years
  • Data not owned by a licence group is confidential for 5 years
  • Market available data is confidential for 10 years.
  • Interpreted data is confidential for 20 years
• Data from a licence area which is relinquished or surrendered, is no longer confidential.
Fact Pages
FactPages

NPD FactPages contain information regarding the petroleum activities on the Norwegian continental shelf. The information is synchronised with the NPD’s databases on a daily basis.

Purpose

The NPD has a national responsibility for data from the Norwegian continental shelf. The NPD FactPages represent a contribution in this context.

Feedback

We constantly strive to improve this product, and welcome any kind of feedback. If you have comments or questions please e-mail us at factweb@npd.no

Use of content

The content on the Norwegian Petroleum Directorate’s FactPages can be copied and used free of charge as long as all materials are marked with their date, reference and link to their source. This information must appear prominently.
NPD Fact Maps - www.npd.no

• integrated with the FactPages
• contain information regarding petroleum activities on NCS
• all information is synchronised with NPD's databases daily
• FactMaps are offered in HTML5 and Silverlight (advanced edition)
  • Can filter, query, add your own data or services, re-symbolize and more.
Concession rounds - Licencing
Two systems for new awards

Mature areas

Awards in Predefined Areas (APA)
- Good geological understanding
- Fields and infrastructure developed
- Less likelihood of major new discoveries
- Play field for smaller companies

Frontier areas

- Traditional licensing rounds every second year
- Areas considered to be immature
- Still possible to make major discoveries
Announced blocks in the 23rd Licencing Round

- The Norwegian Sea: 3 blocks
- The Barents Sea: 54 blocks

- Application date: 2 December 2015
- Award: First half of 2016
Award criteria – MPE and NPD

• Technical expertise

• Financial strength

• Geological understanding

• Experience
  • NCS or other similar areas
  • Other activities
Norwegian licensing round - Milestones

- Invitation to nominate: ~2-3 months
- Nomination: ~2.5 months
- Public Hearing: ~1.5 month
- Announcement: ~1.5 month
- Application: ~5-6 months
- Negotiations: ~4-6 months
- Awards

NPD performs evaluations of the announced blocks. This forms an important basis for the evaluation of applications.
Awards – by the Government

The concession contract:

- Operator
- Participating companies and interest
- SDFI – State’s Direct Financial Interest?
- Concession area, work programme, duration, milestones
- Terms of relinquishment
- Any restrictions related to environmental or fishery concerns
- The companies have to enter a Joint Operating Agreement and an Accounting Agreement for Petroleum Activities with the license partners
Diskos – Joint Industry Project 1990’s

How could the NPD manage reported data efficiently?

- Huge amounts of data to be stored - increasing rapidly
- Poorly managed legacy databases
- Lack of common data standards
- Difficult to transfer data from system to system
- Poor data quality
- Loss of data on magnetic tapes

- NPD chose to cooperate with oil companies to solve the problem
Diskos – The Norwegian National Data Repository

- Funded by the NPD and Norwegian Oil industry – “Shared Solution”
- Raw data from Norwegian Continental Shelf
- Standardizing
  - Datatypes
  - Data formats
  - Data model
  - Procedures
Datatypes in Diskos NDR

• Seismic data
• Well data
• Production data
Diskos - 47 members
21 Associated Members

- Seismic acquisition companies
- Consultancy companies
- Data services
- Etc.
University Access

- Norwegian Universities
- UK Universities (selective)
- Norwegian Geological Survey
  - free online access to the database
    - Research
    - Education
  - Access to public data
  - Access to confidential data if there is agreement with the data owner
Diskos Business Model

- **Data loading**
  - Operator
  - Oil co
  - Companies pay for loading

- **Data storage and software**
  - Diskos
  - Members
  - Shared cost 47 members (annual fee)

- **Data download**
  - End
  - Users
  - Companies NOK/GB

- Companies pay for loading
- Shared cost 47 members (annual fee)
- Companies NOK/GB
- Open, PPDM data model, provided by CGG’ Trango solution
- CGG quality verification tools, tape copying and transcription software

- Data operations, support and administration will be provided from KADME’s offices in iPark, Stavanger
- Open architecture framework, provided by KADME’s Whereoil platform

- Main data center will be the EVRY facilities in Green Mountain
- Secondary data center also operated by EVRY, in their facilities in Forus
Evry – Data Centre Services

- Forus, Stavanger
  - Data receipt
  - Data loading
- Disaster Recovery site
Green Mountain – Main Data Store

DC1-Stavanger

DC1-Stavanger is a unique underground data centre in a former high security NATO ammunition storage facility.
Site overview – Rennesøy

The greenest data centre in the world
Seismic data

- Guidelines for reporting Geophysical data (Yellow Book)
- See www.npd.no
- Main focus is on seismic data
- See also Table S-1
NPD Reporting Requirements – Seismic Data

• Processed post-stack seismic data (SEG-Y) all “significant “ versions are to be reported:
  • Field data (SEG-D)
  • Pre-stack Nav-Seis merge volumes

• Velocity Data

• Navigation data
  • In accordance with ”Specifications and Information for Reporting Navigation Data”

• All associated documentation
  • Acquisition, navigation, processing reports
  • Observers logs etc.
Volumes of seismic data in Diskos NDR

Seismic data volumes in Diskos NDR (Terabyte)
Well data

• Current Guidelines:
  • Reporting requirements for digital well data (Resource Management Regulations, Section 24). ("Blue Book")

• Detailed specifications on the NPD website www.npd.no

• Digital reporting is required within 6 months of the completion or abandonment of a well.
  • Reporting applies to exploration and production wells
Most data sets did NOT meet the Reporting Standard without additional value-added work.

Today – reported data complies with NPD requirements.

The “Blue Book”

NPD Requirements - in dialogue with the industry

Variable quality deliverables. A lot of work required to load to database.

Historical Well Data

Standard Level

Time
## Well data stored in Diskos NDR

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<tr>
<th></th>
<th>January 2016</th>
<th>February 2016</th>
<th>March 2016</th>
<th>April 2016</th>
<th>April 2015</th>
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<tr>
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<td>In Total</td>
<td>Public</td>
<td>In Total</td>
<td>Public</td>
<td>In Total</td>
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<td>6817</td>
<td>7497</td>
<td>6840</td>
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</tbody>
</table>

- **Accumulated Number of Norwegian Wellbores with Documents and Reports**
- **Accumulated Number of Wellbores with Online Log data**

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### Graphs

- **Bar Graphs:**
  - Bars represent data from January to April 2016 for accumulated numbers of wellbores, documents, and data volumes.
- **Line Graphs:**
  - Lines show trends over time for accumulated numbers of wellbores, documents, and data volumes.
Production Data

- Monthly allocated reporting
Production and Sales Information

• Production per well
• Injection per well, installation and field
• Flared gas
• Fuel and diesel used
• Stored quantities
• Sales of oil, condensate and NGL products per ship cargo
• Gas sales
Production Data – Monthly data

- Information can be shared within a licence and reported easily to third parties
Access to data
Data Access in Norway

• **NPD**
  - NPD Fact pages
  - Well data
  - Core photos
  - Data from relinquished areas
    - Interpreted data - on application

• **Diskos Databases**
  - Operated by CGG and Kadme
  - Seismic, well data and production data
  - Data trading
Data Access – Members and non-members
Online Access to seismic data through Diskos (WhereOil)
What data is available? Well and seismic data
Zoom in on areas of interest
Standards & data management organisations
Technical Standards

The SEG Technical Standards Committee serves as a forum for discussion of geophysical developments in which standards for acquisition and processing of geophysical data need to be identified or improved. When data problems of a sufficient magnitude to warrant action by SEG are identified, an appropriate subcommittee is appointed to develop a set of standards and make a recommendation to the Executive Committee concerning their adoption. The committee works in partnership with a wide range of industry organizations. Standards are provided below in PDF and Microsoft Word as a convenience to the geophysical industry. Questions or comments about the documents, or corrections needed to them, should be reported to the committee chairman.

Key links

- SEG Technical Standards Committee
- SEG Technical Standards Committee online collaboration community
- Purchase SEG standards in print
- SEG-Y Revision 2 draft
Energistics is a global consortium that facilitates the development, management and adoption of data exchange standards for the upstream oil and gas industry.

Upstream Standards. Bottom Line Results.
Oil & Gas business decisions, safety of personnel, assets, operational activities, and also protection of the natural environment, are often dependent on having complete, correct, consistent and current information of our operating locations and areas of interest.

Geomatics is the combined discipline of Survey & Positioning and Geospatial Data Management, and provides accurate positioning and mapping support across the full O&G life cycle.

The most recent update about the Committee’s work is available [here](#).
EPIM – Reporting Formats – e.g. MPRML

Reporting Formats

A service maintaining and enabling enhancements to common reports.

EPIM is the responsible body for maintaining and enabling enhancements to some of the common reports to authorities and license partners on the NCS.

The standard XML schemas and corresponding reference data resulting from collaborative projects are under continuous development by the stakeholders in the oil and gas industry.
ECIM - 11th. to 13th. September in Haugesund

"Delivering Value - Applying Methods and Technology"

The "ECIM 2017" E&P Data and Information Management Conference and User Meeting will be held in Scandic Maritim Hotel, starting Monday afternoon September 11th. until Wednesday 13th. early afternoon.

The conference days are busy, the atmosphere is intense, and we are staying at a very nice hotel and conference facilities in Haugesund, a medium sized city located between Bergen and Stavanger, just an hour and a half away by bus or boat from Stavanger.

Registration will be open from beginning June.

Conference Days Program Overview

Exhibition area will be open from Monday afternoon and until Wednesday lunch.

**Monday September 11th.**
12:00 Registration, networking and meetups
19:00 Opening session
20:00 Social Program

**Tuesday September 12th.**
08:30 Plenary session
11:30 Lunch
12:30 Parallel Workstream sessions
18:30 Social Program

**Wednesday September 13th.**
08:30 Parallel Workstream sessions
11:30 Plenary session
13:00 Lunch

We will begin publishing the conference program from late June.
ECIM 2017 September 11th to 13th
‘Delivering Value - Applying Methods and Technology’

The most important Conference and Meeting Place in Europe for E&P Data and IM Professionals

• Call for Paper - ECIM 2017

We invite you to submit papers for the 22nd ECIM International E&P Data and Information Management Conference 2017. (Within May 10th.) For more information and download of Speaker Form, please use this link: www.ecim.no/cfp2017

• Registration opens mid June
www.ecim.no/2017

ECIM
National Data Repository Meetings
- NDR2017 – 6-8th June Stavanger, Norway

• NDR Conferences
  • Participation from many nations
  • Exchange of ideas
  • Organisation, business models
  • Collaboration on standardisation, legislation

• NDR12 2014
  • Hosted by SOCAR
  • Azerbaijan

• NDR 2017
  • Hosted by NPD
  • Stavanger, Norway
  • 6-8. June 2017
  • See: http://www.ndr2017.org/