NORSOK D-010 REVISION

D-010 Well integrity in drilling and well operations

- P&A Seminar 17.10.2019
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Presentation overview

- Organisation of standards revision work
- The four NORSOK Drilling standards
- D-010 revision 5 project
  - Overview
  - Milestones
  - Major changes
- Challenges
Organization of drilling standardisation work

NORSOK Owners
Federation of Norwegian Industries, Norwegian Shipowners Association, Norwegian Oil and Gas Association

Sector Board Petroleum Industry
Tri-partite executive committee, responsible for the standardization work

NORSOK Expert Group – Drilling
Responsible for the content of the four standards within drilling

Standard Norway
Contracted by the NORSOK owners to administer the portfolio of 68 standards

Drilling Managers Forum
Norsk Olje & Gass, Operators forum

D-010 Revision project
Project manager and work groups
## Status of the four NORSOK D-standards (drilling)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Name</th>
<th>Current revision</th>
<th>Industry pre-hearing</th>
<th>Expected publication of new revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-010</td>
<td>Well integrity in drilling and well operations</td>
<td>Rev 4, 06.2013</td>
<td>03.2017</td>
<td>06.2020</td>
</tr>
<tr>
<td>D-002</td>
<td>Well intervention equipment</td>
<td>Rev 2, 06.2013</td>
<td>08.2018</td>
<td>12.2019</td>
</tr>
<tr>
<td>D-007</td>
<td>Well testing system</td>
<td>Ed 2, 09.2013</td>
<td>08.2018</td>
<td>06.2020</td>
</tr>
</tbody>
</table>
D-010 revision: Project milestones

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open industry pre-hearing</td>
<td>2017.03</td>
</tr>
<tr>
<td>Revision project approved</td>
<td>2017.09</td>
</tr>
<tr>
<td>Revision commenced, work groups formed</td>
<td>2017.11</td>
</tr>
<tr>
<td>Work in work groups</td>
<td>2017.11-2019.09</td>
</tr>
<tr>
<td>Finalizing text after presentation to Eg-D</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Draft document out for hearing</td>
<td>2019.11</td>
</tr>
<tr>
<td>Assessment of comments, text adjustments</td>
<td>2020.03</td>
</tr>
<tr>
<td>Publication of Revision 5</td>
<td>2020.06</td>
</tr>
</tbody>
</table>
Major changes in the document (1)

• Standard Norge has adopted ISO format for all NORSOK standards:
  ▪ Changed chapter structure; chapter 3 split into 3 & 4
  ▪ Figures and tables are numbered continuously through the document
  ▪ Informative references are moved to separate Appendix “Bibliography”
• Chapter 3 Definitions:
  ▪ Adapted ISO definitions of «Shall», «Should», «Can» and «May»
  ▪ Included note for PSA’s definition of «Should», relevant for NCS only
• Chapter 5 (old 4) Barriers:
  ▪ New; Barrier requirements matrix
• Chapter 6 (old 5) Drilling
  ▪ Included DMF-approved capping stack emergency preparedness requirements
Major changes in the document (2)

- Chapter 10 (old 9) Plug and Abandonment:
  - Cement height adjustments
  - Significant revision of
    - EAC Table 22 (Casing cement)
    - EAC Table 24 (Cement Plug)
    - EAC Table 52 (Creeping formation)
    - EAC Table 55 (Material Plug)
    - EAC Table 56 (Casing bonding Material)
    - Section 9.6.2 (characteristics of a permanent well barrier)
  - New EAC tables
    - EAC Table «60» (Perf/Wash/Cement)
    - EAC Table «61» (Cement Plug in a section-milled interval)
Major changes in the document (3)

• Chapter 14 (old 13) Managed Pressure operations; completely reworked
  ▪ Includes new Appendix B covering operational requirements
  ▪ Technical requirements moved to D-001
• Appendix A; BOP testing matrix
  ▪ Allowing for testing to Section Design Pressure at first BOP installation, current requirement is test to Well Design Pressure test
  ▪ Accepting 14 days test interval, even if well section is completed and new casing is set in the interval.
• Appendix B, MPD operations (new)
  ▪ Includes operational requirements
• Normative references; moved to separate appendix; “Bibliography”
Challenges

• Industry is very busy, again
  • People have little spare time
  • Difficult to prioritize
  • Delays

• D-010 is an important, and very extensive, document
  • Reaching consensus can be time consuming
  • Consensus is a prerequisite for a good standard
  • Maintaining an international profile
Questions?
Back-up slides
D-010 revision project: Overview

- Follows «NORSOK direktiv A-001»
- This will be revision 5
- Follows a five years revision cycle
- Project manager is Arild Thorsrud
- Drilling Managers Forum and NORSOK Expert Group Drilling have been actively used in the quality assurance process

- Organised in 10 work groups
- Has approximately 60 participants from
  - Oil companies
  - Major service companies
  - Specialist companies
  - Petroleum Safety Authority (observers)
- For more information regarding petroleum standardization, see
Goals for petroleum standardisation in Norway

The goals of the NORSOK organisation are to:

• Ensure a high standard of safety
• Increase the use of international standards
• Reduce the number of requirements specific to Norway
• Reduce the number of company specific requirements
• Ensure that standards represent cost-effective solutions
• Increase the competitive strength of the Norwegian continental shelf