Oil and Gas UK WLC PfF
Well Decommissioning Group (WDG)

Update on Guidelines

5th European SPE Seminar on Well Abandonment
Aberdeen, 21st April 2015
Martin Mosley (Talisman-Sinopec), on behalf of WDG
Presentation Outline

Update on O&GUK WLCPF Workgroup activities relating to Well Abandonment:

2. Well Status Descriptors Workgroup
4. Guidelines for the Qualification of Materials for the Suspension and Abandonment of wells – Issue 2
5. WDG Challenges & future plan
Well Decommissioning Guidelines Update
Well Life Cycle Guidelines Groups

- WLC PF
- Steering Committee
- Well Decommissioning Group
- Well Life Cycle Integrity Guidelines
- Sub-committees
- Well Status Descriptors
- Well Decom Guideline
- Cost Estimation Guideline
- Material Qualification Guideline
O&GUK WDG – Purpose, Objectives & Workgroup

Provide guidance to make well plugging & abandonment more efficient, effective, safe and with low environmental impact.

• Provide up-to-date guidelines to enhance industry capabilities for Well Decommissioning

• Facilitate technology development, trials, and promote initiatives

• Liaise with DECC, H&SE and other Stakeholders on technical issues specific to well decommissioning

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<td>Jules Schoenmakers</td>
<td>Shell</td>
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<td>Max Baumert</td>
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<td>Sandy Fettes</td>
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Context of the Guidelines - Regulatory requirements

UK Well Regulations (The Offshore Installations and Wells (Design and Construction, etc) Regulations 1996 (DCR) are Goal-setting, not prescriptive (what to achieve, not what to do):

The well-operator, shall ensure that a well is ...... suspended and abandoned that:

- SFARP - No unplanned escape of fluids from the well
- Risks to the health and safety of persons from it, anything in it, or in connected strata are ALARP

Well-operator’s are expected to develop “in-house rules”, use good industry practice, assess and reduce risks to ALARP, and apply well examination

License holder has to comply with Energy Act and model clause requirements for every well (bore), including:

- Applications to DECC to change or suspend activities on a well through Well Operations Notification System (WONS)
- Provide information on environmental risks associated with wells
- Document the future intent and plans for decommissioning of wells, Asset Retirement Obligations, insurance cover, etc.

Guidelines assist with compliance, provide criteria and examples of good practice
Well Decommissioning Guidelines Issue 5: What has changed?

Update based on experience and feedback. Many revisions to phraseology and following more significant ‘technical’ revisions:

‘Suspension & abandonment’ replaced with decommissioning – connotation of abandoned wells, but plug & abandonment of wells remain in Energy Act and model clauses and H&SE Regulations.

Well Abandonment and Well Decommissioning are synonymous.

Glossary – ‘zones with flow potential’ replacing ‘permeable zones’

- Well bore status descriptors defined

3. Material requirements for permanent barriers - clarification of; sealing, position & continued suitability

4. Zones with flow potential (Chapter 4 re-written) – clarification of the assessment and isolation requirements of zones with flow potential
Issue 5: What has changed (2)

6 Requirements of permanent barriers
Cap rock barrier characteristics clarified in relation to zones with flow potential

6.3 Open-hole requirements - Clarification of permanent barriers for open hole

6.4 Cased hole requirements - Clarification of cemented casing – quality and quantity / extent / location of cement

Assessment of original cementation and need for remediation during abandonment
Issue 5: What has changed (3)

7. Verification of a permanent barrier - requirement for better definition of acceptance criteria for enhanced assurance of abandonment of multiple wellbores

8. Special considerations for abandonment - Enhanced guidance relating to; liner laps, casing cuts, magnesium salt impact on cement integrity, overburden competence, trawl-ability of phase 1 & phase 2 abandonments

9. Phases of decommissioning wells - Definition of phases of abandonment - suspension & temporary abandonment removed from these guidelines

9.2 Well re-entry considerations – clarification that abandonment (decommissioning) of sections of wellbores are permanent and reference to WLCIG should be made for temporary barriers and suspension systems

Appendix A - Abandonment design information required input sheet updated in relation to flow potential and annulus isolation
Well Status Descriptors Workgroup - Context

To provide better and consistent definitions relating to; plugging & abandonment of wells and suspension of well operations.
To provide ‘well status descriptors’ used in industry guidelines and regulator guidance notes, Well databases, & WONS 2 Applications & Notifications
Will continue until: CDA & DECC licensing have completed revision to WONS, potential inclusion of DECC Environment Team risk characteristics associated with ‘suspended’ and shut-in subsea wells

WSD Workgroup: Tai Olaoya (O&GUK), Richard Salway (CDA), Phil Harrison (DECC), Steve Cromar (COP), Martin Mosley (TSEUK)
Well Status Descriptors – Changes to O&GUK Guidelines & Industry Databases

Well Status Descriptors – are a combination of Mechanical (well structures) barriers present and Operational status (e.g. constructing).

• The Guidelines for Decommissioning of Wells - now relate to the phases of abandonment (1, 2 & 3) prior to final decommissioning of the well origin and all associated bores.

• CDA and WONS data headers to describe the mechanical / operational status of well origins, wellbores and wells.

Status descriptor definitions in WD Guidelines Issue 5 includes:

Well, Well Origin & Wellbore

Constructing, Operating, Shut in & Plugged

Abandoned Phase 1, 2 & 3

CDA have updated well data records with Well Origin and associated Wellbores.

The restructuring of WONS data headers using the Well Status Descriptors is currently ongoing.
Descriptors identified during review process will be included in the O&GUK, DECC WONS & CDA & OPOL guidance as required:

WLCIG issue 3 will clarify the terms: **suspended activity**, **shut in** and **plugged** as they apply to different phase of the well life cycle.

**Suspension** – relates to temporary suspension of well operations, i.e. *it is not the well that is ‘suspended’ but the activity or operation.*

**Shut in** - considered temporary, with an intended date of e.g. plugging or re-instatement or operation defined. the operator will be expected to define in applications and notifications, a date when the suspension of activity will cease.

**Intent** - i.e. the Intended date for completion or resumption of activity will replace usage of non-specific terms e.g. **Permanent, Temporary, Short term, Long term** that previously lead to a lack of clarity relating to the planned or acceptable duration of the status of a well.

**Plugged** - Purpose, number and location of plugs, type of material (e.g. cement), design (e.g. mechanical), and permanence or expected longevity and verification

Review and approval of guidelines by O&GUK members /stakeholders will ensure acceptance of revised nomenclature
Cost Estimation Guideline - Revision Context

Guidelines on Well Decommissioning Cost Estimation Issue 2 – relatively minor revisions to the first (2011) issue

Guidelines for cost estimating liabilities of wells for Asset Retirement Obligations (ARO), Financial statements, Asset sales (Not AFE for a well)

Guidelines have been adopted widely by operators - leading to consistent preparation of estimates for partner review etc.

First described the ‘3 phases of abandonment’ - which are now included in; benchmarking, the Well Decommissioning guidelines, and well status descriptors in the CDA database and new WONS

Issue 2 Review Team:
Sandy Fettes (Fairfield)
Martin Mosley (Talisman-Sinopec)
Tom Gillibrand (BP)
Taiwo Olaoya (Oil & Gas UK)
Cost Estimation Issue 2: What has changed

The name - abandonment replaced with decommissioning

Introduction & Objective – rephrased

Description of Estimation process – clarification of assumptions, scope, accuracy and risks affecting range of estimates

Clarification of Contingency and extreme event inclusion in estimates

**No changes** to P&A Code, Phases and Complexity / work types of abandonments

Appendix 1 – Clarification of interface with updated O&GUK Decommissioning Estimating Guidelines

Appendix 7 – Subsea E&A Well Categorisation **removed**
**Cost Estimation Guidelines**

P&A Code (Phases and Types / Complexity) for work scope dovetails with abandonment guidelines and benchmarking

P&A Code = PL 3/3/3

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P&A Code dovetails with benchmarking

Abandonment Performance Review

401 abandonments published (March 2015)

Initiated by WDG in 2010
Now 19 participants
401 abandonments
Managed by Rushmore Reviews
Guidelines for the Qualification of Materials for the Suspension & Abandonment of Wells - 1st Issue 2012

• Alternatives to cement are being developed, but have found little application due to uncertainty of the long-term integrity

• Issue 2 revision has just started

Material Types:

A. **Cements, ceramics (setting), porous.** e.g. Portland Class H and G cement, (Pozmix, Slag)

B. **Grouts (non-setting), porous.** e.g. sand or clay mixtures

C. **Polymers thermal-setting & composites, not porous.** e.g. resins

D. **Polymers thermoplastics & composites, not porous.**

E. **Polymers elastomers & composites, not porous.** e.g. silicone rubber

F. **Formation, not porous.** e.g. shale, salt

G. **Gels, not porous.** e.g. bentonite gels, clay gels, polymer gels

H. **Glass, not porous**

I. **Metals, not porous.** e.g. steel, alloys, bismuth

Material Characteristics:

- **Functional requirements**
- **Failure modes**
- **Critical properties**
- **Acceptance criteria**
- **Testing method**
Well Decommissioning Group – Other Activities

• Revisit Workgroup topics / challenges for action
• Cement Logging through tubing. ITF project started
• Casing Cement confidence of quality of cement
• Qualification of Bismuth. ITF project ongoing
• Downhole Cables and Lines : still no solutions
• Through Tubing Abandonment Workshop in Summer 2015 – cover Section Milling, perforation washing etc.
• EU Directive, DECC, OGA, Competent Authority – licencing and environment issues. SCR revision etc.
• Support Benchmarking
• Support industry facilitation of existing and new JIPs
• Liaise with P&A Forum on alignment with Norsok-D010, etc.

Guidelines will be circulated to O&GUK members for comment
Thank you for your attention
Comments or Questions?

WDG Topics Register includes new issues / developments

UCA cement strength reduced by contamination

This is what we think

Idealised Case

Experimental results

spacer

17 lb/gal cement

10 lb/gal mud

Ref: D. Calvert, D. Knight - SPE20349 (1994)