

## Proposal for Benchmarking Well Abandonments performance

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Rushmore Reviews Annual Participant Meetings  
6th November 2007

Ref: TLE002



### Benchmarking Well Abandonments

Compare performance  
Identify best practices  
Calibrate performance

Many fields approach Late Life status. Field decommissioning activities will increase dramatically over the next decade.

Significant improvements are required, jointly carried by the industry. Technology, practices, standards, regulations to be shared.

Late Life Assets often change owner. Financial liabilities are a key parameter in Asset sales/swaps, but reference data points are few.

Non-campaign well abandonments give distorted performance picture

Drilling and completions are extensively being benchmarked in the industry, Well Abandonments are not.

### Proposed approach to Well Abandonment Benchmarking

1. Oil & Gas UK WG4b have agreed on critical data requirements, compiled in Questionnaire
2. Some trial data have being collected by WG4b members
3. Propose impartial, reputable external company to manage, administer data collection, compilation, access, marketing
4. Expand to operators worldwide (draws attention to the issues of well abandonment).
5. Analysis of data will be deferred till critical mass of data is available, e.g. defining complexity parameters
6. Best practices sharing on ad-hoc basis, conferences, forums, workshops

### Proposal provisionally supported by (pending further definition)

- Oil and Gas UK, WG4b
- BP
- ConocoPhillips
- Shell Europe
- Shell International
- Talisman Energy UK
- Total E&P UK

### Questionnaire details: Guiding principles

- Keep it simple  
(e.g. approx rough depth, 5/10/15k pressure)
- Little effort to complete  
Recommended to be completed by Ops Engineer immediately after job  
(trial: 1<sup>st</sup> well 20 min, next wells 3 minutes each !)
- Avoid cumbersome data analysis  
(critical well aspects as yet unknown)
- Normalise cost when largely determined by rig rate  
(i.e.  $Cost_{norm} = Cost_{Act} - days * RR_{act} + days * RR_{norm}$ )
- Definitions to be established to minimise confusion, to be incorporated in Questionnaire spreadsheet to ease completion

### Well Abandonment Benchmark Questionnaire (1)

#### Structure of Questionnaire

- A : General
- B : Well details
- C : Work details

		Example input
A1	Well name	ABC
A2	Country	UK
A3	Year of Abandonment	2007
A4	Year of well construction	1979
A5	Operator	Shell Expro

### Well Abandonment Benchmark Questionnaire (2)

WELL DETAILS		
B1	UKOOA Category	2.1
	1. (Removal of Wellhead)	
	2.1 (One annulus uncemented, additional barrier required)	
	2.2 (Two annuli uncemented, additional barriers required)	
	3 (Significant intervention required, with rig)	
	4 (Downhole status unknown / not possible)	
B2	Land/offshore well	Offshore
B3	Platform well (Yes/No)	Y
B4	Well suspended at the mud line (Yes/No)	N
B5	Subsea well (Yes/No)	N
B6	Exploration of Appraisal well (suspended) (Yes/No)	N
B7	Re-abandonment (Yes/No)	N
B8	Number of Discrete Permeable zones to be separated	3
	1	
	2	
	3+	
B10	Fluids in permeable zone	Gas
	Oil	
	high GOR	
	Gas	
	Water	
B11	Number of permeable zones with H2S	0
B12	Max initial pressure of permeable zone to be abandoned	5k
	5k well	
	10k well	
	15k well	

### Well Abandonment Benchmark Questionnaire (3)

B13	Hole Angle (Max)	23
B14	Completion Type	Single
	Single completion	
	Dual Completion	
	No completion present	
B15	Tubular access	Accessible
	Tubular accessible	
	Tubular access constrained but millable / removable	
	No Tubular access and not millable / removable	
B16	Number of annuli that carry pressure	0
	1	
	2	
	3+	
B17	Deep cables or control lines present in annulus	Y
	Annular Control lines	
	Annular Electrical cables	
	No annular cables or lines	
B18	Presence of radioactive scale (LSA)	N
	No LSA	
	LSA Present	
B19	Quality of well records (covering construction to present)	M
	Good : Information fully reliable (No contingencies required)	
	Medium : Information questionable (Limited contingencies required)	
	Low: Information unreliable (Large number of contingencies required)	

## Well Abandonment Benchmark Questionnaire (5)

WORK DETAIL		
C1	Rigs type and duration (days)	
	Semi (normalise cost at \$200,000/day)	
	Drillship (normalise cost at \$300,000/day)	
	Jackup (normalise cost at \$150,000/day)	16.5
	Platform rig	
	Tender rig	
	Land rig (normalise cost at \$30,000/day)	
	Host cost (normalise cost at \$30,000/day)	
	Other. Specify in comment box	
	For mobile rigs, duration of rig move to well site or non-well scope included in duration above	2.5
C2	If rigless, workunit (days)	
	Dynamic Positioned Dive / ROV vessel	
	Coiled Tubing	
	Hydraulic workunit	
	Slick line unit	
	Electric line unit	
	Pump Unit	
C3	Number of cement plugs set	4
C4	Number of tubular strings deep-cut and recovered	2
C5	Number of casing sections milled	0
C6	Number of plugs set over casing liner tops and casing stumps	0
C7	Number of production packers removed	0
C8	Retrieval of surface tubulars included (Yes/No)	Y
C9	Abandonment part of a campaign of similar work (x3). Number of wells.	6
C10	Well depth of upper production packer (Along hole, rounded to 1000 ft)	9000
C11	Cost of well abandonment, excluding rig move to well site (million \$)	3.3
D1	Comments	Free format

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## Current data: 29 well abandonments

- Land wells Through Tubing :  
10 well campaign (Brunei Shell) +1 rigless NAM
- Platform wells :  
4 well + 6 well campaign, Jack-up, Shell, Southern North Sea UK  
4 individual wells, platform rig, Shell, Northern North Sea UK  
ongoing: 40 wells, platform rig, BP, North Sea UK,  
under consideration: 24 wells, platform, Total, North Sea Norway,
- Subsea wells :  
4 individual wells, semi, Shell, North Sea UK

As yet, too few data points to make comparisons

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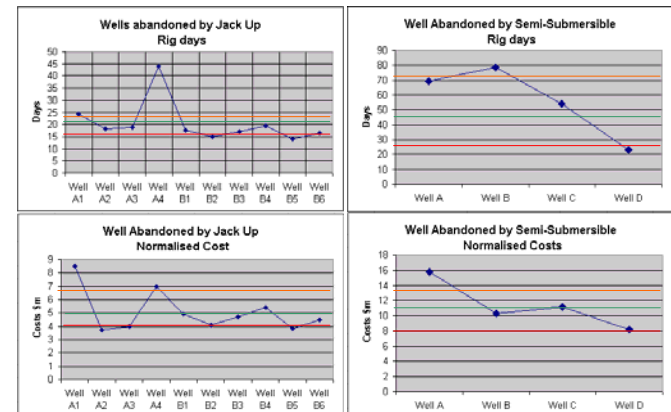
## How to present the compiled Well Abandonment performance

- Well name with cost and time, for selected group, e.g. type of well or type of work unit.
- Show Quartiles performance
- Analysis to be postponed till critical data volume is present.

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## Presentation examples with Quartiles



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### **Every activity carries risk: for this benchmarking proposal**

- Insufficient data quantity (no critical mass)  
(possible reasons: too few participants, too expensive, no priority)
- Inadequate data definition (unreliable data)
- Lack of open attitude of participants  
(unreliable data, not willing to share)
- Abandonment jobs vary wildly, no comparison possible
- Coverage limited to one region
- Rushmore Reviews declines
- .....

### **Conclusions**

- In addition to drilling and completions benchmarking, a benchmarking of Well Abandonments is proposed.
- Questionnaire of data items has been presented.
- Benefits:
  - Performance comparison
  - Calibrate Late Life liabilities in well abandonments
  - Share best practices/failures, technology, trials

### **Discussion**

- Is there an industry need for benchmarking of Well Abandonments ?
- Is the effort worth it ?
- Is the proposed approach supported ?
- Are the data items descriptions clear and complete ?
- Are you willing to provide abandonment performance data ?
- What are the next steps ?

**On behalf of Oil & Gas UK Workgroup 4b,**

**Thank you !**

For Suggestions or Clarifications please contact  
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