

Delivering P&A Technologies Through Industry Collaboration

(an Independent Facilitator's Perspective)



Anthony Onukwu - ITF

Plug & Abandonment Workshop, Stavanger 14th June 2012



FACTS

- The costs of subsea well abandonment operations in the UK and Norwegian sectors are forecast to be in the region of £9.5- 17.5mn per well
- Many of Statoil's fields on the Norwegian continental shelf (NCS) are reaching the end of production. More than 1000 wells need to be abandoned due to field decommissioning over the next 5 to 25 years. Of these, almost half are subsea wells.
- A UK North Sea Well Abandonment Study (Issue 3 Nov 2008) commissioned by UK Oil and Gas concluded: In the subsea well abandonment sector, existing technology is capable of performing a rigless abandonment approach using Well Intervention Vessels (WIV), for approximately 554 wells (ie. 61% of UK North Sea subsea wells)
- In the subsea well abandonment sector, an additional 220 wells (24% of subsea wells) could potentially be undertaken in a rigless manner, if new technology is developed, (in such areas as well control, string tubular recovery, etc).
- With this information above, everybody will agree that new technology and solutions will be needed to overcome these challenges via **industry collaboration!**

Welcome to ITF

- Global “not for profit” organization (*Est.1999*)
- Facilitates technology development through to implementation
- Owned by oil and gas companies
- Over 180 projects (JIPs)
- Currently: 40 ongoing projects - £20 million



ITF Member Companies



“Line Up For Today”

- How does industry collaborate via ITF (Benefit of Collaboration)
 - History of P & A Challenges Identified Via Industry Collaboration
 - These Technology Challenges ... No change even beyond borders?
 - Project Proposals Progressing As Result of Collaboration
 - Summary & “few food for thought”



How does industry collaborate via ITF

MEMBERS/INDUSTRY

- Global Technology Challenges
- Technology Cluster Challenges
(example is P & A challenges)
- Regional Technology Cluster Challenges
(example is P & A Challenges)

DEVELOPER

- Developer /Researcher Scoped Proposals
- Member Scoped Proposals
- Pioneer Funded Proposals (Proof of Concept)

Benefits of Collaboration Via ITF

Networking
Opportunity

Proven
Process

Common
Contract

Low Cost,
Low Risk

History of P & A Challenges Identified Via Industry Collaboration ("Wish List" for P & A professional)

- Well abandonment acoustic tool
- Subsea well abandonment
- Multi-String Cutting
- Smart tools for final abandonment
- Alternative plugging materials

“ITF members P & A Challenges as of July 2009 ”

Challenge	Title	Summary
Challenge A	Solving the Cable Issue	Ability to remove the gauge cable secured to the outside of Completion tubing in order to meet Oil and Gas UK Guidelines
Challenge B	Logging Through Tubing	Ability to identify / Confirm what fluids or other materials (cement) are in each annulus, the condition of the tubing and casing strings, and where the top of good cement is in each annulus
Challenge C	New Materials Challenge	Development and qualification of a reduced cost alternative material (to cement) with suitable properties for the plugging and abandonment of oil and gas wells
Challenge D	Tagging And Verification Of Cement Plugs With Wireline	Ability to verify the location of the permanent barrier where coiled tubing or jointed pipe is not available
Challenge E	Cementing Multiple Annuli	Ability to place cement in the B & C annuli with the completion tubing still in place
Challenge F	Wellhead Removal	Ability to remove the wellhead with the completion tubing still in place (i.e. cut through production tubing as well as the 9 5/8", 13 3/8", 20" & 30"/36" casing strings a minimum of 10ft below the seabed)



These Technology Challenges ... No change even beyond borders?

NORTHSEA P & A CHALLENGES	NORWAY	UK
CONTROL CABLES ISSUES	Re-design of control cables and hydraulic lines. Removal of cable/line across a barrier in existing wells, to allow through-tubing abandonment (no rig needed).	Tackling the control line/ cable issue Overcome control cable limitations
SUBSEA ABANDONMENT	Rigless quality abandonment of subsea wells	Cheaper access to subsea wells Purpose built abandonment medium (vessel vs. Rig?)
ABANDONMENT MATERIAL INTEGRITY ISSUES AND VERIFICATION	Promote the development of through-tubing logging techniques of the cement bond (zonal isolation) in multiple casing annuli. Validation of measurements.	Logging through dual casing strings – CBL Multi casing and radial cement bond log cement ✓ improved verification methods (cementing)
MILLING ISSUES	How can we remove downhole obstructions (steel, cement ...) without traditional milling?? Abrasive maybe?	Abrasive Cutting in 4'5" tubing through to 30" strings at once. Multi-string casing cutting challenges. Section milling with coil tubing (Dual string? 4 1/2" through to 7")
ALTERNATIVE PLUG MATERIALS	Swelling clay material as cement replacement.	Alternative plugging ✓ Formation shale ✓ Bismuth



P & A Project Proposals Progressing...



Independent service for acoustic down hole logging tool validation for well integrity – Phase 1

WWW.TNO.NL

TNO | Knowledge for business



TNO Netherlands

PREAMBLE

Currently it is not possible to log through tubing to measure quality of the cement bond or pack-off of drill solids behind casing.

PROPOSALS

The goal of this proposal is to establish a consortium to serve as a Centre of Excellence and promote development of sonic tools.

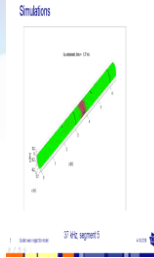
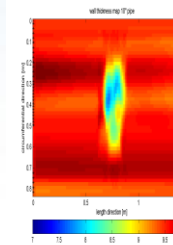
- ✓ An industry technology roadmap for acoustic logging to be developed by the project partners to guide the technology development programme.
- ✓ TNO's existing model based methods are to be evaluated and used for tool validation. The value of model based validation will be tested in a second work package through a case study of an existing or newly developed tool.
- ✓ The established CoE will promote development by soliciting industry proposals and provide technical advice on proposed 3rd party tool development to sponsors of those developments.

Sponsors: 4/5 potential sponsors with technical support from 4 service companies

Funding: 141.24K Euro

Duration: 9 months

Progressed to contract



Proof of Concept – Bismuth (Alternative Well Abandonment Plug)

Rawwater Engineering Company Ltd



Rawwater Engineering
Company Limited

PREAMBLE

Industry sources estimate that to some lesser or greater degree many abandoned onshore cement plugged wells leak. Not only is this a risk to the environment, but the operating companies will be exposed to additional re- abandonment costs.

FIRST ATTEMPT SOLUTION

In response to this problem (RECL) and Seal Well Inc. of Canada developed and deployed a new type of 4” P&A plug in two gas wells in the Suffield Development, Alberta. The proprietary design of the plug is based upon the controlled deployment of a bismuth tin (Bi/Sn) metal alloy creating a very high integrity metal-to-metal seal.

THE PROPOSAL

Following from the Suffield abandonment and encouraged by the offshore O&G industry, RECL has proposed a joint industry project (JIP) to develop a range of offshore well abandonment plugs

Sponsor: (currently 6 organisations in contract phase)

Funding: 1.6M Pounds - £200K ticket per sponsor

Duration: 24 months



Summary & “Few Food for Thought”

- Little or no change in challenges as of 2009!
- The challenges across borders are almost same.....
- If so.....
- Align UK and Norway North Sea P & A Technology Challenges and Find Solutions together!
- Low risk, greater benefit at low cost
- Delivering P & A technology via Industry Collaboration – should it be the way forward?

Any Questions ?





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www.itfenergy.com

