Through Tubing Logging - Plugging and Abandonment

CALL FOR PROPOSALS
August 2015
Aim
The Industry Technology Facilitator (ITF) is seeking proposals from qualified organizations to develop cost-effective technology solutions to improve through tubing logging; specifically to verify the hydraulic seal, e.g. determine the quality of cement, behind one or more casing strings when logged through production tubing.

Justification
ITF members have explicitly identified a need for a tool or device that will help to verify a hydraulic seal during plugging and abandonment activities. The current method of choice in the industry to verify a hydraulic seal is to determine the quality of the cement, however alternative techniques will be considered.

Who Should Respond
The invitation is open to all organisations with the knowledge necessary to develop solutions for well logging activities. This includes credible entities from small and medium sized enterprises, academic and research institutions, as well as large industry organisations.

Qualifying Technologies
In order to qualify for potential sponsorship, technologies submitted in response to this Call for Proposals must:

- Seek to address the identified requirements
- Be novel or innovative
- Demonstrate a clear business case for support
- Possess a clear and demonstrable path to commercialisation and implementation

Expression of Interest (EOI) submitted to any other ITF Call in the past nine months or any previously unsuccessful applications should not be resubmitted, without first consulting ITF.

Benefits of Participation
- Funding: Up to 100% funding for project costs
- IP Protection: A proven confidential, collaborative and standard contractual process
- Exposure and validated applications for your scientific and technological expertise
- Access to the key global players in the oil and gas sector
How to Participate

Your contact points for this Call for Proposals are Malcolm Stone and Lisa Hutchison.

In the first instance please consider completing the Project Proposal Abstract Form which is available here. Once received one of our Technology Team will contact you to discuss your idea and the submission process further, which will include the completion of an Expression of Interest (EoI) which will provide a brief outline of your project proposal.

If you require any further information please contact +44 (0)1224 222428 or +44 (0)1224 222424, e: m.stone@itfenergy.com or e: l.hutchison@itfenergy.com, alternatively please call +44 (0) 1224 222 410.

Background to the Challenge

There are a number of significant challenges that operators face during plugging and abandonment (P&A) operations. Consequently, there are a range of opportunities for technology and innovation to help reduce the impact of these by providing access to new capabilities and/or providing new work practices.

A number of specific activities within this broad range of challenges have been identified by ITF members to be addressed through the development, or adoption, of new or reworked technology. A key challenge is the lack of effective technologies that can verify a hydraulic seal behind tubing and casing. Typically, cement forms part of the well construction and provides both structural support to the casing and zonal isolation; therefore a good cement-to-pipe bond is required. A key element of P&A activity is obtaining a dependable assessment of the quality of cement in the well.

When a well is abandoned or plugged, permanent barriers are put in place to ensure that all zones with a flow potential are isolated from each other and from the surface or the seabed. Currently, the primary method to achieve this is to use cement to form plugs which are placed to achieve the necessary seal. In wells where historical well construction data is poor, and the cement integrity is unknown, the common approach to setting the appropriate barrier plugs is to cut and pull tubing then log the casing to determine whether a good cement barrier exists behind the casing which will provide hydraulic isolation. If isolation can be verified, an internal barrier is then set inside the casing thereby forming a formation to formation barrier. If isolation between the casing and formation cannot be proven, the casing must be removed, usually through milling operations to ensure access to the cap-rock. This is required to allow for the necessary wellbore seal for the cement, or other suitable plugging material, to be made in order that the plugs can form a seal in perpetuity. Their placement is extremely important.

Removal of the casing is an expensive and time consuming task which, in most instances, requires a rig to enable removal of the ‘Xmas tree’ from the well and rigging up of pressure control equipment onto the well. These rigs have a typical hire rate of £250k per day. Consequently, if a technology existed to verify casing to formation isolation through tubing, there is the potential for associated cost reductions in well P&A activities. Recent estimates have determined that there are over nine hundred wells to be abandoned in the UKCS alone over the next ten years, further emphasising the scale of the prize.
The Requirement: Desired Criteria and Capabilities

ITF seeks solutions which conform to the following criteria depending on the relevance to your technology solution. In priority order:

Primary Criteria (compulsory for usability)

1. Improved accuracy, efficiency and performance
2. Retrievable information
3. Minimal impact on operations

Desired Criteria (would be highly advantageous)

4. A measurable reduction in uncertainty in comparison with current state-of-the-art technologies
5. Readily usable with current well deployment tools
6. Cost advantage over current technologies
Details and Suggested Areas for Technology Solutions

Addressing the following key technology themes and improvement areas should assist in successfully dealing with this challenge. This is not an exhaustive list and ITF is open to proposals which may contain scope from outside of these suggested areas. These are:

- Verification of hydraulic seal behind one or more casing strings when logged through production tubing
- Confirmation of cement bond, or lack of, in multiple annuli and cement jobs through tubing
- The requirement to gauge the quality of cement through tubing
- Any tool must be compatible with a 3.5 inch internal diameter tubing
- The required capability to ‘look’ through the wall of a pipe, fluid, and another piece of pipe and assess cement quality on the other side
- The ability to determine the status of the annuli
- The ability to ascertain the location, type and composition of materials behind the pipe
- Technology to run on electric-line to give real-time readout
- Capable of withstanding temperatures of 80 °C to 170 °C
- Suitable for running in wells with hydrostatic pressures of 3,500psi to 7,000psi

ILLUSTRATIVE WELL SECTION
Technology Readiness Levels of Proposed Solutions

This Call is open to developers who wish to tackle the challenge of through tubing logging. Solutions which are cost-effective and can be used with existing facilities will be particularly welcome.

Solutions may fall into one of three maturity categories. Kindly advise ITF which category your proposal falls under:

- **Quick Wins** - These will typically be late Technology Readiness Level (TRL) technologies or the modification of existing technologies
  - *Expected project time frame: up to 3 years*

- **Mid-term Projects** - These will typically be projects which have reached Proof of Concept (mid TRL). Such projects may be phased
  - *Expected project time frame: 3 – 5 years*

- **Long-term Projects** - These will typically be early TRL projects which are yet to reach Proof of Concept. It is expected that such projects will be phased. For projects in this category, only proposals to reach Proof of Concept will be considered. Later phases may be funded based on ITF member feedback and results
  - *Expected time frame: up to 3 years (for initial phase)*
ITF’s Role and Approach

ITF is a not for profit organisation owned by major oil and gas operating and service companies that comprise its membership. ITF has an impressive track record in facilitating the launch of collaborative technology projects funded by our members to help develop or advance technologies for the oil and gas industry, and includes projects from early stage research and development through to field trials and commercialisation. Since 1999, ITF has supported over 200 projects and secured over £60 million in funding from our members. ITF’s key objectives are to identify technology needs, foster innovation and facilitate the development and implementation of new technologies. Our single objective is to make technology impact on our industry.

A fundamental element of ITF’s role as an internationally recognised champion for facilitating research, development and deployment of technology innovation within the upstream oil and gas industry is to engage with key industry sources. ITF uses a well developed and tested process, working in collaborative participation with both its Members and industry to identify technology needs and potential solutions.

The ITF process, illustrated below as a step-by-step course of actions, endeavours to bridge the gap between the industry’s large global players and the development community with the ultimate aim of implementing new technology solutions:

- **Step 1 - Understand and Identify Technology Needs**
- **Step 2 - Engage the Development Community / Invite Proposals**
- **Step 3 - Evaluate Proposal Submissions**
- **Step 4 - Secure Funding**
- **Step 5 - Assist the Launch of JIPs**
- **Step 6 - Facilitate the Implementation of Technologies**

ITF has contractual confidentiality arrangements with all its Members and will enter into a parallel agreement with all organisations and developers submitting proposal applications. Proposals will be submitted to our Members only for the purpose for which they are provided, i.e. assessment for funding support and implementation.

Proposals submitted under this call will be reviewed for sponsorship by all ITF Members; therefore this is an excellent opportunity to gain a global audience in seeking support for your capabilities. The focus of all ITF themes is to identify technologies which bring clear benefits to sponsors but which require assistance in research, development, and/or field trial.

For details of ITF’s full Portfolio of Members, please visit our Website at [www.itfenergy.com](http://www.itfenergy.com)
Technology Challenge Deadline

The ITF Technology Challenge follows a staged timeline from the identification of the challenge through to the launch of successful projects. Our ‘Call for Proposal’ process allows for early assessment of a relatively brief EoI submission prior to developing detailed proposals for those developers that are successful in passing our stage-gate member evaluation process. Our commitment is to keep developers apprised of the process including those proposals that are rejected.

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<td>The Deadline for Submitting an EoI</td>
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Register interest with ITF

Register your interest as early as possible by completing the Project Proposal Abstract Form which can be found on the itfenergy website [www.itfenergy.com](http://www.itfenergy.com). This will be automatically submitted to the Technology Team at ITF.

Once received ITF will then contact you to discuss further. Note: In order to progress your submission, ITF will require a Confidentiality Agreement to be in place: early contact will expedite this process.
ITF Contact Information

If you would like to discuss any matters related to this call or any other issue related to ITF, please contact any of the following people:

Technology Challenge Analyst and primary contact point for this Call:

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Contact Address for all of the above:  
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For more information on ITF please visit the ITF Website - [www.itfenergy.com](http://www.itfenergy.com)
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