

Completions Technology

An Open Invitation for Proposals from Technology Developers

Aims

ITF members invite credible proposals from the international research and development community who would like to source partners and funding to research, develop, trial and implement potential solutions that will help achieve improved completions technology. The specific areas of interest are:

- Alternatives and/or removal of control lines
- Wireless/innovative control solutions for harsh environments
- Stand-alone, down-hole power units

Justification

ITF members, major operating and service companies in the oil and gas sector, met at an international ITF Technology Challenge Workshop (TCW) and identified the current challenges they are facing as an industry.

The challenges identified are market sector specific and defined by the industry.

Who Should Respond

The invitation is open, and encourages, responses across all relevant industry sectors from small and medium sized enterprises, academic and research institutions, and large industry players alike. This is an open invitation to any organisation seeking partners and funding for **innovative technologies** in the oil and gas industry to submit high quality proposals for **research, development, and / or field trial**.

Benefits of Participation

- Access to the key global players in the oil and gas sector
- Exposure of your scientific and technological expertise
- Potential 100% funding for your research and development
- A proven confidential, collaborative, and standard contractual process
- Funding for any stage of the research, development, and demonstration cycle

How to Participate

Your contact points and outline method for submitting a proposal are provided in this document but you can immediately learn how to submit a proposal by going to our website <http://www.oil-itf.com/index/submit-a-proposal>

Alternatively you can ring us and talk to one of our analysts about your idea, +44 (0)1224 222410.

Key Words

Drilling; managed pressure drilling; rotating control; continuous circulation; control systems; automated control; condition monitoring; drill bit technology; harsh environment engineering; down-hole tools; wellbore strengthening; high speed data transfer; vibration management; predictive analysis; rock mechanics; drilling fluids; water-based and oil-based drilling mud; chemicals; down-hole control lines; wireless technology; battery technology; novel power generation systems; power storage systems; accumulators; sensors; high performance electronics; wellbore strengthening; borehole stress; borehole irregularities; ultrasonic technology; fibre optics; harsh environment connection systems.

(NB. The above list is not necessarily exhaustive).

Readers who are not familiar with the industry may find using some of the above terminology on a *Wikipedia* search on the internet would lead to some useful initial descriptions of the industry and associated techniques. It will also provide other links that would be equally useful.

Completions Technology Challenges

The biggest challenge relating to completion technology is the control lines, or more specifically the removal of control lines from the well completion.

Control lines operate a variety of equipment down-hole, functions such as power for the activation of equipment, communications for gathering well data, and delivery of chemicals for selective multi-point chemical injection in the well. Systems currently in place are highly complex with a variety of connections and procedures. The aim would be to find alternative means to activate and control equipment, and deliver chemicals.

The physical removal of control lines from the completion will require wireless technology and local power generation and storage that work in the harsh down-hole environment.

Wireless data transfer would greatly aid in obtaining real time well data from the surface to assist operators in decision making. Existing systems require a variety of penetrations with intrusive components which cause problems with well reliability and operating expense. The goal would be to reduce costs associated with hardware and software throughout well life management. New technologies will be required to aid in the transfer of data wirelessly in order to achieve this.

The generation and storage of power down hole is a challenge. The main uses for power down hole are communication and activation of equipment. Reducing the complexity of existing systems as well as finding alternative forms of power down-hole will greatly reduce capital and operating expenses. Innovative technologies need to be reliable and have a degree of redundancy.

Wherever possible systems need to be non-intrusive and have retrofit capabilities for existing use.

The Challenges

- Innovative technologies to provide operators a means to command and control equipment down-hole from the surface
- Innovative communication systems that can operate in a high pressure and high temperature environment (e.g. up to 20,000psi and greater than 220°C), as well as being able to withstand vibration
- Consideration of combined systems that can perform multiple tasks utilising multiple data points to control equipment, e.g. use of fibre optics
- Ability to control a variety of zones without the need for hydraulic intervention, e.g. hydraulic accumulators may offer a means of generating power for activation.
- A desire to reduce the complexity of existing systems, e.g. more functions through a single penetration
- Wireless data transfer systems that are reliable and redundant over the life of the well with minimal intervention

- Wireless data transfer systems that operate at low frequencies, with minimal power requirements. Such techniques as Balanced Audio Technologies using ultrasonic technology may offer solutions
- Innovative and less complex ways of generating and storing power for down-hole applications. For example, consideration could be given to power generation and storage using fluid flow or ground source temperature. Such sources will have power requirements of up to 100 milliamps, and ideally have a capability that will last for 20 years (or more)
- Development of rechargeable batteries for down-hole application as well as multiple charge batteries that can be switched on and off when power is required
- New methods to monitor the integrity and health of current control lines providing real time data
- New connectors that will improve upon existing technologies taking into account reliability, redundancy, splicing and possible retrofit capabilities

ITF's Role & Approach

The Industry Technology Facilitator (ITF) is a not for profit organisation owned by, and with access to funds from major oil and gas operating and service companies that comprise its membership. ITF has an impressive track record in delivering finance to help develop new initiatives for oil and gas technologies from early stage joint industry projects (JIPs) through to field trials and commercialisation. Since 1999, ITF has supported over **150** projects worth **£50 million** in funding. ITF's key objectives are to identify technology needs, foster innovation and facilitate the development and implementation of new technologies.

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 proven 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 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 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 Theme will be reviewed for financial sponsorship by **all ITF Members** therefore this is an excellent opportunity to gain a global audience in seeking support for your technology. 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 - www.oil-itf.com

Theme Timeline

The ITF Technology Challenge follows a staged timeline from the initial workshop through to launch of successful projects. The following list of tasks describes the key milestones and their associated date:

- Programme Start: Technology Challenge Workshop May 2010
- Call for Proposals Issued Aug 2010
- ***Deadline for Receipt of Proposals*** ***08 Oct 2010***
- Publish to Members for Review Nov 2010
- Member Review and Voting Dec 2010
- Technical Clarification Meeting Jan 2010
- Members finalise commitment to sponsor Feb 2010

Process for Submitting a Proposal

1. Register Interest with ITF

Register your interest as early as possible by sending an email to Mark Anju at m.anju@oil-itf.com.

2. Visit the ITF Website - www.oil-itf.com

On the ITF Home page, click on the "How to Submit a Proposal" button or follow [this link](#) to access all the information required to submit a proposal.

3. Read the 'Project Application Guidance' Document

This document is available to view or download from the 'ITF Downloads' / 'Proposal Submission' section of the ITF Website. Reading this document prior to submitting a proposal is essential. If you require further clarification or are unsure if your proposal is suitable for submission, please call ITF (Contact Information below).

4. Download and Complete the 'Project Application Form'

This form is available to download from the 'ITF Downloads' / 'Proposal Submission' section of the ITF Website.

5. Download and Complete the 'Project Presentation Template'

This template is available to download from the 'ITF Downloads' / 'Proposal Submission' section of the ITF Website.

6. Email the Completed 'Project Application Form' and 'Project Presentation Template' to ITF

Email the Completed 'Project Application Form' in Microsoft Word format (not PDF) and the 'Project Presentation Template' in Microsoft PowerPoint format (not PDF) to Mark Anju at m.anju@oil-itf.com by **no later than 8 October 2010**.

Qualifying Technologies

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

- be applicable to at least one of the identified requirements
- be novel or innovative
- demonstrate a clear business case for support
- have a clear and demonstrable path to commercialisation and implementation

Note: Proposals submitted to any other ITF Call in the past nine months or any previously unsuccessful applications should not be resubmitted without first consulting ITF (contact information provided later in this document).

Qualifying Organisations

Proposals are invited from any organisation including SME's, academia, research institutions, large organisations, consortiums or alliances. Proposals may be submitted by a national or international organisation, and equal opportunities will be extended to all proposers. Please keep in mind however that should your proposal be taken forward, you will be required to participate in meetings and make presentations to interested parties in the UK and in the English language (teleconference and video conference are acceptable).

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 manager and primary contact point for this Call:

Mark Anju - ITF Technology Analyst

Email: m.anju@oil-itf.com

Tel: +44(0)1224 222420

Other members of team available for your support:

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For more information on ITF please visit the ITF Website - www.oil-itf.com