

## Advanced Drilling Techniques 2007

### ***A Collaborative Approach to Investment in Technology***

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 raised approximately **£30 million** in direct JIP support, with projects linked to an estimated **£20 million** of equity investment, and over **£20 million** in trials funding.

ITF accesses funds from the 20 major oil and gas operating and service companies that are ITF members. Proposals submitted under this call will be reviewed for financial sponsorship by all ITF members. This is an excellent opportunity to gain a wide audience in seeking support for your technology.

ITF has contractual arrangements on confidentiality with ALL its members (operators and service companies) and ITF 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. (Note: our members are listed on our website site [www.oil-itf.com](http://www.oil-itf.com))

### ***An Open Invitation for All Technology Developers and Suppliers***

As the size of oil and gas discoveries become smaller, it is important that exploration and production techniques are far more cost effective. Moreover as we move into harsher regions and deeper reservoirs our capabilities need to be enhanced to capture reserves in a more productive and effective manner.

This is an open invitation for all organisations seeking sponsorship for ***innovative advanced drilling technologies*** to submit proposals for ***research, development and field trial*** of technology in the following areas:

- Reduction of Costs and Risks of Drilling
- Enhanced Drilling Capability
- Environmental Issues

A list of specific technology challenges that are of interest to ITF members may be found later in this document.

ITF Member companies have assets and operations throughout the world. We are therefore inviting proposals for technologies that may be applicable to the North Sea and any other geographical area.

Those interested in submitting a proposal should respond registering their interest as early as possible by sending an e-mail to [info@oil-itf.com](mailto:info@oil-itf.com).

## ***Qualifying Technologies***

To qualify for this call, your technology must:

- Be applicable to upstream oil and/or gas production or associated services
- Fulfil at least one of the items within the expressed needs for technology within this invitation.
- Be novel or innovative
- Demonstrate a clear business case for support
- Have a clear and demonstrable path to commercialisation and implementation.

## ***Qualifying Organisations***

Proposals are invited from any SME, university, large organisation, consortium or alliance. Proposals may be submitted by a national or international organisation, and equal opportunities will be extended to all proposers. Please bear in mind however that should your proposal be taken forward, you will be required to attend meetings and make presentations to interested parties in the United Kingdom and in the English language.

## ***Background to the Advanced Drilling Techniques Theme***

ITF uses a thematic approach working in collaborative participation with its members to identify common areas of interest and technology needs. This Call aims to stimulate proposals from the global development community, which ITF and its members will assess, and our members will fund those of highest interest.

One key theme for 2007 identified by ITF members is the application of **Advanced Drilling Technology**. The focus of this theme is to bring forward technologies, with clear benefits to sponsors, which require assistance in **research, development or field trial**.

ITF is also interested in receiving ideas for feasibility studies, which will attract a lower level of funding. Please contact us if you are considering a submission of this type and we will advise you how to proceed.

## ***How the Technology Needs were Defined***

A central part of ITF's work is to take views from a number of industry sources (such as end users, service providers, and suppliers) to identify key technology challenges that would bring about a substantial increase in production, improve recovery rates or extend the life of a facility.

This consultation includes taking views from individuals and through ITF run workshops. One such workshop, held in partnership with **our members, Demo 2000, the UK Department for Business Enterprise and Regulatory Reform (BERR), and the Norwegian Ministry of Petroleum and Energy** established an interest in collaboration and in seeking proposals with a view to making a commitment to invest. All topics included in this call are attributable to an expression of interest by ITF members.

It is not the aim of ITF, or its members, to prescribe specific technology solutions but to stimulate innovative proposals that fit with identified needs. The descriptions for each topic have therefore been made generic to allow for flexibility in interpreting the most appropriate technical solutions.

### **Process and Schedule**

The Proposal Application Form is available for downloading on our website at [www.oil-itf.com](http://www.oil-itf.com). Using the Guidance Notes (also to be found on our website), please complete the form and return it electronically in MS Word format (NOT PDF) to Keith Mackie at [k.mackie@oil-itf.com](mailto:k.mackie@oil-itf.com) **NO LATER THAN MONDAY the 4<sup>th</sup> FEBRUARY 2008.**

In addition, we request that you complete a two slide PowerPoint presentation as detailed in the Guidance Notes, which backs up your proposal submission in a concise form.

***NB. Please read the Guidance Notes carefully before completing the Proposal Application Form as failure to provide the necessary information in relation to your technology may result in premature disappointment.***

Proposals received after the deadline may not be processed. Therefore please ensure your submission reaches ITF before the specified deadline.

### **About the Industry Technology Facilitator (ITF)**

ITF (The Industry Technology Facilitator) is a not-for-profit organisation owned and supported by 15 major oil & gas operating companies and 5 service companies (the 'members'). ITF is the vehicle through which the members fund joint industry projects that meet the technology needs of the upstream oil and gas industry. ITF has the remit to facilitate the **research, development, and application** of new, high impact technologies that will increase overall hydrocarbon recovery from mature basins.

To date, ITF has launched over 100 Joint Industry Projects representing a direct investment of approximately £30 million.

For further information about ITF click on [www.oil-itf.com](http://www.oil-itf.com).

### **ITF Contacts**

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:

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## ITF 2007 Advanced Drilling Techniques Theme

# Call for Proposals

## Specific Technology Needs

*(Any proposal submitted to ITF must address one or more of these identified needs.)*

### **Reduction of Costs and Risks of Drilling**

#### **Background:**

*For a variety of reasons, operators waste money on non productive time (NPT) in drilling. Improving the reliability of equipment is seen as a major catalyst for reducing NPT and thus making cost savings. The industry is therefore looking for developments in these areas. In addition, the sharing of industry knowledge, "lessons learned" and "problems met" are key elements to ensuring that information is stored and used productively. Similar challenges are experienced throughout the industry and although shared resources and internal silos of information do currently exist, there is little industry-wide standardisation.*

*The Members of ITF are seeking technologies or procedures to assist with:*

- Knowledge Management
  - Interpreting and analysing all available data
    - i.e. turning information into knowledge
  - Developing and nurturing industry shared information
  - Ensuring the consistency and quality of data input
  - Risk analysis techniques
  - Real-time data optimisation
    - E.g. ensuring instant decisions can be made before information is out of date.
- Increased reliability and reduction of Non Productive Time (NPT)
- Tool durability
  - Simplified equipment design / reduction of moving parts
  - Increased power supply to tools
  - Improve HTHP tool capabilities (mostly temperature limitations)
  - Predictive tools – extend operational capability
- Tagging systems to make details of specific equipment identifiable
- Reduction of equipment failure
  - Capture of real-time rather than historic data
  - Accurate weather prediction techniques
  - Effective root cause analysis e.g. pressure changes or vibration can lead to equipment failure which in turn leads to NPT
- Automation of drilling operations to reduce human error
- IOR (Improved Oil Recovery)
  - Target to get subsea IOR up to that of the platform wells
  - Improved data transmission rates to optimise rate of production, positional control and wellbore management

## Enhanced Drilling Capability

### **Background:**

Many technologies currently exist to help increase recovery ratio and extend well life. ITF members are keen to take advantage of these "fit for purpose" drilling techniques by adopting best practices and exploring new methods of deployment at lower costs and risk. Casing drilling, TTD and the drilling of multi-lateral wells are examples of technologies that members would like to see enhanced. Instability in well bores is another industry-wide dilemma arising from problems such as collapsed holes, sidetrack holes, lost tools and abandonment of wells prior to reaching targets. Technological developments to help mitigate these factors are invited.

Suggested areas for development or improvement are:

- Casing drilling
  - Drilling with liner in ERD well
  - One trip drilling production
  - Improve casing connection rating for deep, hot wells
- Seabed drilling
- TTD and TTRD
  - Composite coil tubing
  - Through tubing liner-while-drilling
- Automation
  - Fully automated drilling rigs and processes
  - Improved pipe handling
  - Real-time mud monitoring
  - Auto friction test procedure
  - Pump start up
  - Control the tripping process
  - Alarms & Warnings
  - Bit Load Optimisation
- Well placement and design
  - Improved depth control and accuracy
    - (e.g. precise placement of drain hole)
  - Wellhead sharing – 2 to 3 casings per wellhead
  - Well construction while drilling
  - Reduce materials in well construction
- Downhole power generation, storage and harvesting
- Alternative Materials
  - For scale removal
  - For potential weight savings
- Low footprint aluminium rig
- Reduce / eliminate stick-slip to improve rate of penetration (ROP)
- Reduce torque and drag for ERD
- Improve capability of LWD tools for severe wells
- Single bore, slimhole wells
- Aluminium drill pipe
  - Replacing steel for ERD wells
  - Reducing cost of using existing rigs to reach new targets
- Managed Pressure Drilling (MPD)
  - Hazard mitigation
  - Advanced MPD for pore/frac challenges
  - Drilling under-balance from a semi-sub
- Adapt drill string to reduce vibration characteristics
- Improved tools to deal with wellbore stability especially in ERD wells
- Prevention of down-hole pressure fluctuation

- Development of "Cold Muds" for HT Wells to prolong logging tool life and possibly aid thermal fracturing of reservoir rock.
- Arctic Drilling and Operations

### **Environmental Issues**

#### **Background:**

*ITF members are seeking alternative ways of handling drill cuttings. In an effort to minimise spills, microannulus leaks while at the same time increasing waste management environmental awareness, technology solutions are welcomed. Reduced environmental emissions and methods for improving power saving for tools and equipment are key technology challenged in the way that pollution control can be addressed.*

*Technology offerings to tackle the following topics are invited:*

- Cuttings Handling
  - De-oiling
  - Re-use
  - Thermal treatment
  - Treatment at source
  - Reduce cost of transportation onshore
  - Bio remediation
  - Reduce volume of cuttings
- Waste Management
  - Offshore processing of drilling waste
  - Zero discharge drilling technologies and processes – e.g. riserless mud return
  - Contained surface hole drilling system
  - Early detection systems
  - Sand control
  - Removal of drilling mud
- Pollution Control
  - Reduce energy consumption through lighter equipment
  - "Green" position keeping - less Nitrogen Oxide emissions
  - CO2 sequestration at source
  - Combined hydrocarbon renewable projects
  - Safe transfer of bulk fluids
- Arctic Operations

Some acronyms used in this proposal are:

CCS = Carbon Capture and Storage  
 CCD = Continuous Circulation Drilling  
 ERD = Extended Reach Drilling  
 LWD = Logging While Drilling  
 MPD = Managed Pressure Drilling

NPT = Non Productive Time  
 ROP = Rate of Penetration  
 TTD = Through Tubing Drilling  
 TTRD = Through Tube Rotary Drilling  
 XRD = X-Ray Diffraction