

Unlocking the potential from low deliverability discoveries

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THE OPPORTUNITIES

There are over 300 undeveloped discoveries on the UKCS, estimated to contain aggregate reserves of more than six billion barrels of oil equivalent. In order to help progress the development of this significant target, PILOT established an undeveloped discoveries workgroup (UDW) in March 2000. The UDW conducted a comprehensive survey and identified some primary barriers to development. PILOT asked DTI to address the specific, technical barrier of *well deliverability*.

DTI gathered data, performed literature reviews and conducted information-gathering meetings with both oil companies and service/technology providers. Thirty-five undeveloped discoveries were examined in detail. The knowledge gained was used to design an interactive-workshop on “The Challenge of Low Deliverability”, held in Aberdeen in May 2001.

The workshop brought together experts on key enabling technologies and representatives from a range of large- and medium-sized companies and service/technology providers. The initial findings were discussed and further views were obtained. More feedback was gained at a subsequent LOGIC “Accelerated Developments” conference. DTI study results are available at www.dti-sharp.co.uk/. Workshop presentations can be viewed at www.og.dti.gov.uk/information/papers/index.htm.

The main conclusions from this exercise are:

1. The main “well deliverability” barriers are uncertain reservoir characterisation, reservoir complexity, low energy and low permeability.
2. A range of enabling technologies already exists.
3. In many cases, the major stumbling blocks to development are contractual and/or commercial in nature.

High deliverability reservoirs will continue to have investment priority. However, significant hydrocarbon volumes are associated with low deliverability reservoirs and a key challenge over the next few years will be to unlock this potential.

OVERCOMING THE BARRIERS

Undeveloped discoveries that suffer from a well deliverability barrier are typically low permeability, thin- or inter-bedded, variable with uncertain reservoir connectivity or chalk reservoirs with a low micro-fracture density. Low reservoir energy can also be a factor. Figure 1

shows the relative importance of the developmental barriers, expressed as a percentage of reserves affected.

The technical barriers are challenging, but in many cases solutions exist. For example, better-targeted, long and/or multi-lateral well-bores, hydraulic fracturing, under-balanced drilling and non-damaging drilling and completion fluids all have the potential to raise deliverability. The latest resistivity tools can better characterise thin-bedded reservoirs. In other cases, solutions are being developed. ITF recently announced an £8 million commitment by oil and gas companies towards the development of new technologies. This includes funding for projects to better model structurally complex reservoirs and promote advances in the areas of seismic resolution and prediction of reservoir performance from seismic data.

Figure 1 shows that there are often significant non-technical blocks to development. These can range from commercial/contractual issues, such as a lack of access to infrastructure, outdated gas sales agreements and a lack of partner materiality, to “structural issues” such as high fees for old licences and companies having to “pay again” for seismic when taking over a licence.

Figure 2 shows the relative importance of solutions to the developmental barriers. It is apparent that technologies and solutions exist to overcome many of the technical obstacles. Often, a thorough data re-examination and re-evaluation of an undeveloped discovery has revealed a large upside potential, which had been missed previously. Reservoir- and equipment-related risks can be better managed through a combination of field trials, using tried-and-tested techniques, gaining access to geological and production data from field analogues and adopting a decision-risk approach to identify an optimum solution.

It is also clear that non-technical solutions have an important part to play. Figure 2 shows the importance of collaboration between companies, to share knowledge and resources and manage risk. An example is where companies form an alliance to develop their technical capability and generate a sufficient resource target in an area such as under-balanced drilling. This type of collaboration is already happening on the UKCS and the trend looks set to increase. Contractual/commercial solutions are also important and include the handing-over of difficult challenges to specialised companies more suited to the task, agreeing innovative, risk-sharing contracting strategies, implementing First Point Assessment (FPAL) more widely and providing tariff-holidays to mitigate commercial risk.

PILOT set up a “Progressing Partnerships Work Group” (PPWG) in March 2001, to specifically address commercial and other behavioural barriers to UKCS development. Recommendations from the PPWG are currently being implemented with the establishment of a Code of Practice to improve commercial effectiveness and a number of other measures. Information on PPWG can be found at www.pilottaskforce.co.uk.

CHANGING THE MINDSET

The findings from the DTI study indicate that the drive towards low cost is often at the expense of adding value. Some oil companies appear overly conservative and unwilling to pursue more adventurous opportunities.

The three key groups involved in unlocking the potential from low deliverability discoveries are:

- Asset staff (Users)

- Service and Technology Providers
- Procurement staff (Buyers)

Technology Providers frequently find that Buyers and Users have different objectives, though working for the same company. Buyers are driven by 'cost', whereas Users should be driven by 'value'. There needs to be a shift towards value-based procurement practices, with a re-appraisal of company objectives and clarification of the balance between short- and medium-term goals. Similarly, more effective contracts are needed which recognise the impact of risk.

There also needs to be an ongoing evaluation of progress in key technological areas. This could comprise:

- Quantification of potential benefits of key technologies;
- Updates on level of uptake;
- Results of recent field operations;
- Assessment of successes and failures;
- Dissemination of best practices
- Appointment of 'technology champions' within companies to facilitate the uptake of new technologies.

THE NEXT PHASE

The stage is set for a new wave of activity on UKCS developed fields and undeveloped discoveries. The recent PPWG initiative will establish a more efficient business environment and help overcome many of the contractual and commercial barriers to development. It is likely that a number of new, smaller companies will enter the scene. Users, Buyers and Technology Providers will need to respond and work together to overcome the technical barriers.

DTI, in conjunction with ITF and LOGIC, is planning a show-case event on 19 June 2002 with the title "Unlocking Challenging Reservoirs". Details and contact should be made via the events section of the LOGIC website - www.logic-oil.com or by email to: events@logic-oil.com. People interested in participating or suggesting suitable technologies, processes or techniques should contact LOGIC as soon as possible.

Figure 1 : Relative Importance of Barriers

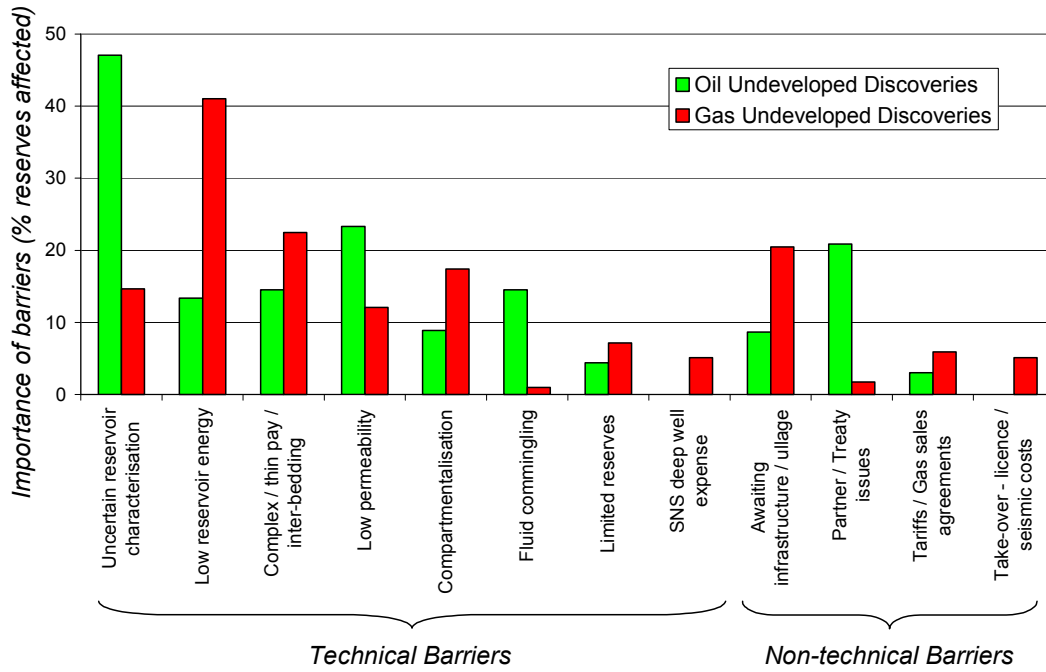


Figure 2 : Relative Importance of Solutions

