



Technology Management Network: Meeting No. 1

Selection of technology Solutions to meet identified needs

Date: Tuesday 2 February 1999 Times: Start: 9.30am, Finish: ~ 16.00pm
Venue: Elf Exploration (UK) Plc, Geoscience Research Centre, 30 Buckingham Gate, London SW1E 6NN. Tel: + 44 171 963 5000.
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Hotel: St James Court Hotel, Buckingham Gate, Tel: + 44 171 834 6655, Fax: + 44 171 233 5014. Standard single £120 (room only including VAT)
Rubens at the Palace Hotel, Buckingham Palace Road, Tel: + 44 171 834 6600, Fax: + 44 171 233 6037. Standard single £99.88 (room only including VAT) *Note! Ask for quiet room not facing Buckingham Palace Road*
Holiday Iann, Victoria Hotel, 2 Bridge Place, Tel: + 44 171 630 6676, Fax: + 44 171 828 1099. Standard single £105 (including VAT)
Please reference the Technology Management Meeting at Elf when booking
Travel: From Heathrow take the Heathrow Express to Paddington (15 mins), then tube to *St James Park*. To reach Elf exit from rear of tube station onto Palmer Street, turn right, then left into Petty France. Keep going straight until you reach the junction with Buckingham Gate where you turn right. The office is down this road on the corner of Wilfred Street. The office is also only 10 minutes walk from Victoria train, coach and tube stations.

Draft Agenda:

		<i>From 9.00am</i>
1.	Welcome and introduction to the day	Elf/ OTM 9.30am
2.	Operator presentation, plus questions & identification of issues	Tom Lawson, Shell 10.00am
	<i>Tea/ coffee</i>	<i>10.45am</i>
3.	Guest company presentation, plus questions & identification of issues	Ralph White, Glaxo 11.00am
4.	Operator presentation, plus questions & identification of issues	Paul Magelssen, Saga 11.45am
5.	Facilitated discussion regarding issues, questions, processes arising from morning presentations	12.30pm
	<i>Lunch</i>	<i>12.30pm</i>
6.	Review of current tools and methodologies	OTM 13.30pm
7.	Facilitated development of best practice process map	14.00pm
8.	Identification of Critical Success Factors	14.30pm
	<i>Tea/ coffee</i>	<i>15.00pm</i>
9.	The Stage Gate decision-making process & its relevance to technology selection evaluation & evaluation	OTM 15.15pm
10.	Website proposal	15.30pm
11.	Review of day, meeting & documentation format, actions arising	15.45pm
12.	Any other business and next meeting	16.00pm
	<i>Meeting closes</i>	<i>~16.10pm</i>



Expected attendees

Tom McGovern	Conoco	Technology Development Coordinator
Alan Burns	Elf	Manager, Contracted Research
Jean-Marc Fontaine	Elf	Director of Research
Ralph White	Glaxo	Senior Project Manager
Mike Taylor	Mobil	R&D Manager
Finn Erik Skaar	Norsk Hydro	Manager - R&D
Jenny Cambers	OTM	Senior Consultant
Chris Dudgeon	OTM	Principal Consultant & MD
Guy Woodall	OTM	Consultant
Paul Magelssen	Saga	Senior Staff Engineer, R&D
Bjorn Karlstad	Saga	Special Advisor
Johan Selmer	Saga	Senior Advisor
Tom Lawson	Shell	Technology Strategy & Planning
Hans Johnsen	Statoil	Based R&D Centre

Apologies: Andy Tilbrook, Amerada Hess, R&D Manager



Selection of technology solutions to meet identified needs

On 15 October 1998 the Technology Management Network met in Aberdeen to discuss the processes associated with the identification of technology needs. Having ranked and prioritised these company requirements it is necessary to identify technologies which have the potential to meet these needs, and to evaluate these in the light of criteria including risk, timescales, cost and manpower requirements. Chosen technologies may be accessible through a number of routes: acquisition, in-house development, externally funded development, JIPs etc. On 2 February 1999 the Technology Management Network will meet to address this core area within the technology management cycle (see Figure 1), which has so much potential to affect the relative success of oil and gas companies.

This subject area includes the following main process steps:

1. Identification of possible technology solutions
2. Evaluation of identified solutions using company-specific criteria
3. Selection of method for accessing chosen technologies
4. Compilation of costed development programme

A number of means may be used by R&D coordinators to identify possible technology solutions. Databases are available of ongoing R&D projects such as CMPT's IPRD; journals cover new products and technology ideas; patent searches may be undertaken; the company itself may have in-house expertise that could be accessed through structured workshops and existing knowledge databanks, and supply organisations will also be continually promoting their own products and development ideas. There are, no doubt, many other sources and the meeting should seek to highlight those which offer cost-effective routes to technology identification. To undertake full literature searches on each technology need for instance, could be very time-consuming and possibly non-productive. Some companies may already employ their own systems for monitoring new, emerging and possible technologies, which may include, for example, a JIP database. Membership of such organisations as PEA, DEA and other technology affinity groups may assist companies to keep abreast of new technologies and thinking.

Evaluation criteria and methodologies will then be required in order to determine the technology that best matches the defined need. It may be that in order to most effectively assess technologies, these need to be evaluated in the full knowledge of the possible access routes. For instance, while one potential solution appears to have a high risk profile there may already be a development project ongoing in the industry which has highlighted the risks and is addressing these in a competent and timely manner. Therefore while there are ostensibly four steps as outlined above, these may be fused in reality in order to streamline the whole process. Often this evaluation step is undertaken using software tools which can address many different criteria (including soft objectives and technology strategy, as well as best fit to a technology need), as well as taking into account issues such as risk.

Technology access routes are many and varied. An important technology may spur a company acquisition or the purchase of an equity stake. A joint venture may be formed with one or more supply organisations and funding partners. The traditional JIP may be employed: the company may buy into an existing JIP or feel that a new one should be instigated. Alternatively, the company may feel it has sufficient expertise in-house to carry out the necessary R&D or may go out widely to the market to select a technology provider. Technology transfer may also be an option, for instance 'borrowing' from a different industry or application. In the meeting, it would be beneficial to look further at the benefits and pitfalls of technology transfer (or we may wish to delay such a discussion to the following meeting). In reality, options may be limited by company policy and the availability or otherwise of funding partners etc. For example, some companies have a set policy which says there will be no in-house development, others seek to maximise competitive advantage and ownership of technology rights.



This is an interesting area; is there an advantage in the long term in having a stake in the technology or does the benefit lie solely in cost effective access?

Lastly, the fully costed programme needs to be compiled and milestones set. Some projects will be ongoing from previous review processes and these may need to be checked against their original targets and the newly identified company targets. Few companies will be able to support projects to meet all their prioritised technology needs and a cut-off point must be sought bearing in mind both direct costs and manpower resources.

At the meeting, much value could be gained from sharing case histories, for example following a technology need through the identification and evaluation of possible solutions and finally to the chosen method for accessing that technology. It will be more meaningful to look at the processes and reasoning utilised in real-life examples. For instance a company may have identified a need to develop satellite fields where existing facilities have limited processing and transportation facilities. The types of solutions which may be considered will be downhole and subsea separation and a production line tie-back to an existing pipeline, a dedicated multiphase pipeline to an existing facility plus an extension of the processing capacity, and so forth. Each solution needs to be costed and the economic benefits (or otherwise) derived together with an evaluation of the technology's likelihood of success (risk profile) and match with the company's need timeframe. Ongoing (if any) initiatives to develop the preferred solution would need to be evaluated to see if any fit the company's cost, time and risk preferences. In the above example, JIPs such as CoSWaSS and the Kvaerner:Reda and Baker-Hughes:Centrilift downhole separation projects would be considered as well as developments such as Alpha Thames' Aesop and ABB's SUBSIS concepts. Alternatively, issues such as flow assurance may be paramount with for instance, hydrate inhibition and wax prevention technologies requiring to be evaluated.

This whole area is complex and OTM believes that more operator presentations at the forthcoming meeting, particularly focusing on case histories, would be beneficial. In addition, we propose giving brief overviews of some of the technology selection tools developed, including our own: 'PTIDES'. Group discussions may also be aided by addressing a real-life example. Hence, we welcome volunteers to give presentations and possible questions for debate. As at the last meeting, we will be seeking to identify critical success factors and best practice processes. It could be worthwhile to try and develop a 'model' process which you can then employ in full or in part as appropriate.

Critical success factors may include the following:

- Good relationships with all levels of the supply chain
- Membership of technology affinity groups
- In-house systems to track emerging technologies
- In-house systems to evaluate and select optimum technologies
- Access to experts who can vision creative solutions
- Stimulation of the supply chain
- Dissemination of needs

At successive meetings of the TMN we will be addressing the following subjects, although the full scope of such meetings will be determined by members' needs:

- Technology acquisition (ie technology development/ technology transfer)
- Application of technologies
- Determination of value added

In addition, it may be beneficial to dedicate a meeting to the issue of knowledge management - an area which is becoming more and more key in this low oil-price environment, where duplication of effort must be minimised and existing knowledge fully exploited.



The OTM Technology Management Cycle

