

# digital energy journal

Report from IQPC's Future Fields  
conference, Amsterdam,  
June 13-14 2006

By Karl Jeffery, editor, Digital Energy  
Journal

## Introduction



Some of the interesting topics covered at IQPC's Future Fields conference in Amsterdam on June 13-14 included how to persuade rig personnel to notify head office earlier if something looks like its going wrong.

We learned about the benefits of governments forcing oil companies to share data; persuading people to trust data on corporate intranets as much as their own spreadsheets; improving the popularity of POSC; and moving from dashboard software to workflow software.

An interesting array of topics – none of which are directly related to the technology itself, but all related to how people use the technology – or maybe we should say, creating technology that people want to use, and persuading them to share data.

Most speakers felt that oil majors need to move faster to open up their IT systems, and not be so paranoid about other organisations getting any kind of access. We learned that Shell declined a request from the UK Department of Trade and Industry for direct access to its computer system so it could retrieve production data.

The issues are very different for new entrants to the oil and gas industry, who normally have a very different sense of how much information can be shared, and are far more comfortable working in complex ways with many different people at once that they have not necessarily met.

## Contents

INTRODUCTION .....	1
SHELL.....	2
<i>Legacy systems</i> .....	3
<i>Better collaboration</i> .....	3
<i>Security</i> .....	3
MARISE MIKULIS, MICROSOFT .....	4
STAN DE FRIES, INVENSYS.....	5
<i>Information</i> .....	6
<i>Invensys and ENI</i> .....	6
<i>Workflow / knowledge management</i> .....	7
<i>Group session</i> .....	7
STEWART ROBINSON, DTI.....	8
SAID RECHCHAD .....	9
INGER FJÆRTOFT, NPD .....	9
TIM PEREGRINE, HALLIBURTON.....	10
MATTHEW OWEN, BT .....	11
ROBERT MAINGUY, ALCATEL.....	11
SENSE INTELLIFIELD.....	12






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## Frans van den Berg, Shell



Frans van den Berg, Smart Fields Foundation Manager with Shell, said that Shell believes that technology can help it get 'towards better than 60 per cent ultimate recovery.

"Shell has established, we want smart technology in all of our existing fields and in all of the new fields," he said. "We want a real time view of what's going on," he said.

"We have field wide monitoring of what's going on. We get production history. It alerts us if something isn't responding the way it should," he said.

Without a real time view of what is going on, the only way to spot problems is when you see that the flow from the rig has reduced, and the only way to fix problems is putting experts in a boat and sending them out to a rig. "It can take 24 hours between a well dying and us having it back online," he said.

"I asked Schlumberger, how many wells in the industry have real time data sent to office," he said. "The answer was 5 per cent. In Shell it is 10 per cent."

Oil companies must face a market with higher hydrocarbon demands, he said. They must be committed to the environment and its sustainable development, have leading technology to handle new complex reservoirs and mature fields, and operate safely, at all times, regardless of the challenges.

Shell is implementing a range of different technologies to achieve this, he said, including subsea technology, 4D seismic, real time data from remote operations, 'intelligent' completions, real time reservoir information, 3D virtual technology and visualisation, operational / financial reporting,

integrated supply chains, transactional processing. It is also using e-learning, including home learning.

"The key concept is having the ability to optimise," he said. "We need to do everything a lot faster."

Developments in the smart fields concept are rapidly gaining in momentum, he said. "I rarely meet people who say, it's all wrong. We're getting more detailed discussion rather than general disbelief. [They see that] we are collecting oil we would otherwise be unable to produce."

One particular benefit of smart technology is having better control of water flooding, he said.

"The conventional way is to open the producers and hope for the best," he said. "The smart way is to analyse all the results. You see that one rock is more permeable - the water goes through faster."

"You can get 20 per cent more oil out and 15 per cent less water. In many cases, we are not constrained by anything other than being able to manage the produced water," he said. "Less water production has an enormous value."

Mr van den Berg talked about the Draugen Field, 160km offshore Norway, where Shell maintains a very detailed reservoir simulation model, including doing water flood simulations.

It does repeated seismic surveys (3D seismic) so it can spot the oil which is not being drained properly and work out how to tackle it.

In one example, Shell found that the well they were planning to drill was close to where the waterfront was, so it moved the well. "We can see what's going on and change what we were planning," he said.

One priority is developing a standard within Shell for its smart fields systems. "We have 200 assets we work with, and many hundreds of fields," he said. "We need a standard architecture that makes this possible without re-inventing the wheel."

"We now standardise - it helps this kind of stuff enormously. We have a standard data acquisition and control architecture."

Shell's tool 'Production Universe,' is used for well monitoring and optimisation. It provides real time information what is coming out of each well. "The system estimates the total flow in real time. We can see the estimated flow in comparison with the total measured flow," he said.

The biggest challenge, he said, is change management. "A lot of people don't like opening valves on a PC," he said. "We have to go through awareness training with all asset management teams."

Shell did particularly well with change management on the Brunei Champion field, he said. "They didn't go with a top down change management program," he said. "The top manager had a strong belief, so people felt comfortable to try out and fail here and there."

"We had a small team that went to the platform, and listened to guys and gradually designed solutions, so people on the field understood what was going to hit them. We had a support desk. We started with a few things and gradually grew."

"They are gradually building up from small to big, designing whole new fields as 'smart fields'. They are trying to build things in from the start they will need."

## Legacy systems

Shell has a large amount of legacy equipment in its wells, which either doesn't produce data, or is not connected to the IT system, or produces bad data.

"There's a huge amount of historic kit out there which is not connected," he said.

A lot of the data is generated by instruments which were calibrated 15 years ago. "We're calibrating them correctly," he said.

"I ask reservoir engineers, is the production data good enough to do reservoir management with," he said. "They say mmm. If you ask them over a beer, they say its cr\*p. We haven't put in the tools to do it."

"We have a production history, but we're not sure what came out of each well at each time. "Sometimes we have to make a model and try to work out what the well did. We need to get better at having the production history," he said.

## Better collaboration

Improving collaboration between different staff members is also a priority.

"We need to get away from how we worked before - we acquired data, geologists built a model, reservoir

people understood the reservoir, production engineers understood the production," he said.

"We need to get everyone to sit together, to do their work in one room. Get the four key disciplines together."

"We need integrated processes where [for example] everyone thought about what would or wouldn't happen if we put in a compressor."

## Security

Shell is making more and more connections between different parts of its network all the time, which means additional security risks. "People get really nervous," he said. "Everybody is struggling with the same thing."

"We build more links because we want to," he said. "For example, we might have someone at the end of the globe monitoring a compressor he knows all about."

"We've had times when pieces of our system have been shutdown by viruses," he said. "But of course we had redundant systems [so no damage was caused]."

The systems are designed so that if there is any concern about hacking, it is possible to immediately isolate the communications network from the control system.

Mr van den Berg said he thought that using Windows "increases the risk seriously, not because of Windows but because viruses work on Windows."

This was disputed by Marise Mikulis, head of oil and gas with Microsoft, who said that there could be threats and hacking with all different types of software, and also people don't realise that new versions of Windows are much more secure than older versions.

## Marise Mikulis, Microsoft



Marise Mikulis, worldwide oil and gas industry manager with Microsoft Corporation, said that a lot of her passion is about accelerating adoption of software tools in the oil and gas industry.

“Commonly the sense is, it’s not happening fast enough. How do we help accelerate the adoption?”

Ms Mikulis has been in the oil and gas industry for 20 years. She was previously chief marketing officer for Upstreaminfo, which supplies asset management systems to the oil and gas industry. Before that she was with Petroleum Geo-Services, POSC, Digital Equipment Corp and Superior Oil Company.

“I want to be provocative – bring in ideas you may not have seen before,” she said.

Ms Mikulis said that many oil and gas companies have got a lot further with installing ‘smart’ technology in individual wells, than they have for the reservoir (integrated operations).

Putting the question to conference delegates, nobody in the room said they had optimised their entire reservoirs, but many delegates thought they had made progress on individual technology and subsystems.

The biggest challenge is persuading colleagues to get more enthusiastic about technology, she said. “We need a lot more confidence and trust. “The soft stuff is the hard (difficult) stuff. We need people willing to take the leap.”

Microsoft has a big advertising campaign called ‘people ready,’ stressing the user friendliness of the software. “That’s the core of what we’re trying to do,” she said. “Corporations don’t do the work, people do,” she said.

However Ms Mikulis noted that new younger employees are likely to have a very different attitude. “A lot of new people coming into the industry have a whole different set of boundaries about sharing, what

information has to be kept confidential and what doesn’t,” she said.

On the topic of workflows, Ms Mikulis said that the topic is “bubbling up more prominently now.”

There is a gradual shift from a dashboard / portal model for software (where you have all the information available on a screen) to workflow software, where the software tells each user what specific task they have to do. “Advancing that I think is quite key,” she said.

Ms Mikulis talked about some of the world changes mentioned in Thomas Friedman’s book ‘The World is Flat,’ because it could be some comfort to oil industry executives to know that the rest of the world is going through the same turmoil as they are.

“When we talk to colleagues about what we’re trying to do, it’s important that they see this is not a spurious activity,” she said. “People have to understand, things have changed while they were looking for oil and gas.”

The book talks about three things all happening at the same time which are forcing enormous change to all industries. These are new ways of doing business, new populations of workers, and new technologies.

The relationships between companies and suppliers worldwide is changing, as echoed in the changing relationships between national oil companies, international oil companies and suppliers. “We can do business in new ways,” she said. “This is the most important force in shaping global economics and politics.”

Ms Mikulis said that most people have an opinion, positive or negative, about POSC (Petrotechnical Open Standards Consortium), a body which develops electronic communications standards for upstream oil and gas. “There is so much scepticism, so many bruises out there, so many failed projects,” she said.

Ms Mikulis talked about the audience vote held at the Intelligent Energy 2006 conference in Amsterdam, about how reliable delegates thought intelligent completions were, with most present saying they thought they were around 50 per cent reliable. This is clearly an inhibitor to further development of the technology.

“There have been some big successes. We have to make sure our colleagues are hearing about them. Our assumptions of vulnerability are not always well founded,” she said. “If our colleagues don’t think this can be done, they’re not going to do it.”

"On one hand, perception is reality for our colleagues. But we need to uncover the facts to shift these perceptions.

"We need to think about where reliability is and isn't. You have operations reliability, project reliability, user reliability and privacy reliability. There are a number of aspects of reliability that are getting attention."

"Certain parts are reliable, like control systems. There is a perception that communications systems and IT infrastructure have questionable reliability."

Ms Mikulis raised the issue of using software to improve the reliability of project management. "We know how much money this industry spends on capital projects," she said. "You can manage projects better if you have more information available. We call it project intelligence."

One way to improve project intelligence would be to bring in digital oilfield technologies much earlier in the exploration and well development efforts.

"The broader the base of the information you can get, the better chance you have of managing it well," she said.

Ms Mikulis raised the issue of using computer game-type tools for training, perhaps enabling the oil and gas industry to draw on Microsoft's expertise building the X-Box. "Computer games are no longer a sub culture," she said. "The average 8<sup>th</sup> grader plays video games over 5 hours per week."

"The Federation of American Scientists (FAS) is producing new learning tools with gaming techniques, that are more usable and attractive," she said. "These tools are highly motivating and can be more impactful in making sure learning gets through. This helps accelerate the depth of expertise. It has the potential to teach complex, higher order skills."

FAS is doing similar work for the US Department of Defence and medical industry, she said.

On the subject of security, Ms Mikulis talked about digital rights management, which is included in standard Microsoft Office software. You can define who can read a document, who can forward it, and how long it lasts for (so access is automatically denied after a certain time).

This is a useful tool to make sure that out of date documents are expired and everybody is using the right version.

## Stan de Fries, Invensys



Stan de Fries, director Upstream Solutions with simulation and process equipment company Invensys, discussed the challenge of real time data, and making sure you get data at the right time.

"You need information 'ahead of real time', because by the time you know something is happening, it's too late," he said.

"For example, how do you know, and when do you know, that a well is loading up."

"You can't afford to wait until it says 'high level' if you have a water problem."

"You need the appropriate time of information and sometimes the time is in the past. There is a range of times we have to deal with."

Mr de Fries talked about WITSML (Wellsite Information Transfer Standard Markup Language) and the soon to be launched PRODML (Production Markup Language) standards developed by POSC.

"There are currently, for the digital oilfield, not enough information and data standards," he said.

"A production data standard must be made for the future, but must be used for the way people implement software today".

Market acceptance of WITSML has not been as positive as hoped, he said. "Part of it is waiting for perfection – we can't do that," he said. "To make things a viable standard, it is important that people work on it."

Quoting Dave Shipley, information management consultant with Chevron, Mr de Fries said that it was not plausible to simply come up with a standard and

connect everyone together. "Culture, safety and laws prevent that," he said.

However he noted that everybody is using WITSML apart from drillship operators. "They won't use it and I don't know why," he said.

With PRODML, a more robust strategy was taken to developing the standard. The number of companies involved and the scope was intentionally limited, and the participants decided that if they did not manage to complete it within a year (Aug 05 to Aug 06) it would not be worth doing.

PRODML is being driven by oil majors BP, Chevron, ExxonMobil, Shell, Statoil. All the oil majors are currently conducting pilot projects using it, including 2 for data management. The initial pilots will be funded by the oil majors involved, and the results will go into the public domain.

The vendors involved are Halliburton, Invensys, OSIsoft, PETEX, Schlumberger, Sense Intellifield, TietoEnator and Weatherford.

"For some of us, it is taking 40 per cent of our time and we still have our day jobs to do," he said.

PRODML is designed to link together the different systems involved in production, particularly the well system and the top side system.

"You buy a system for your wells from someone who builds smart wells. You buy a system for topsides from someone who does process facilities. These different sets of standards will be in play together," he said.

By having the well and topsides working together, it will become possible to improve the optimisation of the equipment, and any artificial lift (e.g. gas lift). It will be possible to improve equipment maintenance.

"PRODML standardises how schedule, forecast and event data is exchanged to adapt optimisation and support surveillance," he said.

PRODML will enable software companies to build tools which can solve problems, not just provide information. "It's not a standard just to connect the dots, plug the data into a model which plays into an optimiser," he said. "That's not enough."

With PRODML, software products from different vendors will be able to work together, not necessarily needing a server. The software companies will be expected to incorporate PRODML into their existing products.

Mr de Fries talked about the importance of building up smart fields implementations gradually, rather than trying to do the whole field at once.

"The most significant failure I've ever seen was where someone got approval to do all the sensors, and hoped that someone else would get approval to do all the communications and software," he said. "Management realised they wouldn't get the benefit until they did it all."

## Information

Oil and gas production could be described as 'real time data rich, information poor,' he said. "Knowledge and wisdom is poor in a digital oilfield system."

To explain the difference between data and information, he said that a piece of data could be something like, "the value is 50", with no context and no knowledge about the quality of the data.

"It becomes information when you know the correct value should be 52. Knowledge is when you know it should be 59, but you can't make it go beyond 60 as a business requirement. Knowing how to get it from 52 to 59 is wisdom," he said.

By having better information, it will be possible to get better information about what your operational constraints are, and see more clearly where the oil and gas phase boundaries are.

"Optimisation tries to move operation to constraints," he said. "Safety systems prevent you from meeting the constraints. There's a natural tension there."

Having better information makes it much easier to predict how much will come out of the well, and manage slugs, sanding and condensates which occur much more with a declining field than with a new one.

## Invensys and ENI



Stan de Fries and Gianluca Fumia, senior petroleum engineer with ENI Divisione Exploration and

Production, had a discussion about different aspects of software in oil and gas.

The first topic was the obstacles to developing software systems which many people can use, or 'groupware', as opposed to 'individual ware', software which just one person uses.

The prime example of 'individual ware', Mr de Fries said, is Microsoft Excel. "Everybody loves their own spreadsheets but can never make sense of anyone else's."

"People say, I don't trust the information from someone else. I want to make mistakes by myself," he said.

Oil and gas companies are developing 'collaboration centres' as single repositories for data, but it is hard work convincing people to use the data. "Senior officers spend up to 40 per cent of their time on telephone and email. People are calling them if they don't believe the information in the collaboration centre," he said.

"Whatever system, you will always find someone with their own private database in Excel," echoed Gianluca Fumia, senior petroleum engineer ENI divisione exploration and production.

ENI has a system to accommodate both, with private and public areas on its server. If employees create something they believe will be useful to other staff members they can move it to the public part of the system.

## **Workflow / knowledge management**

On the subject of putting together workflow software implementation, Mr de Fries said "we should design the digital oil field based on workflows."

"You are going to capture in the workflow design so it's repeatable, so you can handle the decision making in a better way. The workflow software should have the right information to make a good decision," he said.

However he stressed that workflow expertise developed in other industries may not be suitable here. "There's workflow consultants who have the background 'how do you process a purchase order'", he said.

"A simple workflow could be, if the compressor fails, stop production and fix the compressor. Maybe the right answer is something else.

Another challenge is getting the software used, after it has been purchased. "I have seen where a smart workflow project was done but it sits on the shelf," he said.

Mr Fumia from ENI said his main target had been to automate trivial workflows. "There are lots of workflows that can be automated cheaply," he said.

Mr de Fries said he didn't know anyone who was doing a good job with knowledge management and data capture software.

"E.g. – you drill, all kinds of activity happened. There is all kinds of important information about events. How do I relate that to another field across the world? Where is your software capturing those events? I don't mean business intelligence or business analytics."

## **Group session**

A group session, led by Stan de Fries, director of upstream solutions with Invensys, was given the task of finding solutions to a typical problem of well personnel not wanting to keep shore personnel informed of problems soon enough, so when the problems became more serious, there was not enough time to get experts out to the rig, leading to a reduction in production.

Delegates chose one of four groups, infrastructure, technology, business process and people, to look for a solution from a different perspective.

The infrastructure group suggested a robust data communications infrastructure between the rig and the shore.

The technology team suggested systems which can automatically capture data, distribute and interpret it, and store it. They suggested videoconferencing tools so that experts could get involved in solving the problem while on their way to the rig.

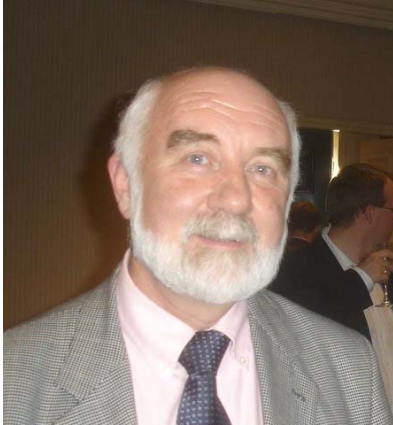
The business process team suggested finding ways to make sure the information was flowing properly to the right people and everyone was following the rules.

The people team suggested team building, and putting shore and rig personnel together in a pub so they could thrash out a good way of working, with staff being rotated between rig and office so they all had experiences of both. There could be incentives for people to communicate more.

Stan de Vries' suggestions were that people in each team could be given better software tools, so they don't have to communicate everything and can keep data they are not happy about to themselves.

However there could be simple rules, that they should make sure they call a specialist early enough if something starts which could lead to a big problem.

## **Stewart Robinson, DTI**



Stewart Robinson, energy resources consultant with the UK Department of Trade and Industry (DTI) gave his perspective on the use of information technology tools in the oil and gas industry, against the background of oil running out, demand growing too fast, cost doubling, new supply getting smaller, proven reserves proving to be illusory, hurricanes taking away capacity and most oilfields being past peak production.

The industry has technology which can extend the life of the oilfields, he said. But in order to do that, he said, oil companies need to talk to each other more and share information.

"Can the job get done? It has to. The alternatives – going back to living in trees – is not very good. Mankind is clever and the oil industry is crucial."

Mr Robinson is sceptical of the benefit of knowledge management software. "I don't understand the effort put into knowledge management capturing what 60 year old people know," he said. "The consultants that made money out of knowledge management are doing incredibly well."

Mr Robinson said that a lot of progress was needed with web services, so that companies could share data with one another.

"We need to expand what companies are doing beyond the firewall," he said. "Everything I've seen to date on the digital oilfield is companies looking inwards."

As an example, when the UK government asked Shell for permission to enter its computer system so it could automatically find out about production data (rather than have it communicated manually) Shell refused, he said.

"There is paranoia in the oil industry which does not exist in other industries," he said. "If the web is good enough for online banking why isn't it good enough for completion dates."

"You need data when you want it, not when someone else wants you to have it," he said. "Those are the blockers. The timeliness of data can be improved with web services."

"Nirvana at UK Department of Trade and Industry is all the data I want available when I want it, in a form I can use and correct."

On the subject of data standards, Mr Robinson said "I want the industry to come up with some proper standards so we can mandate it."

Governments can help force oil companies to share data with one another, he said. "That's why you need governments. But Governments don't always know what they are doing. But you can teach the government."

Mr Robinson said that the forthcoming standard for production data – PRODML – is very much needed.

It has been put together in a very different way to the previous standard, WITSML, which was "set up by hobbyists – people who worked for companies and realised they needed a standard," he said.

Pressure on governments to maintain oil production will mean an increased need in the future for regulatory reporting in all countries, he said.

"POSC can help," he said. "I've been part of POSC for 15 years because I know you need standards. I think POSC has achieved quite a bit."

Mr Robinson noted that POSC recognises it has a problem with a lack of industry confidence. "It is rebranding itself," he said. "In October this year it will have a name change probably. They've taken on marketing consultants talking to oil companies at senior level."

## Said Rechchad



Said Rechchad, IT manager of Italian oil company ENI's affiliate in Egypt IEOC, talked about IEOC's efforts to make its documents going back 55 years electronic. IEOC produces 30 to 50 per cent of the oil in Egypt.

IEOC developed an online digital archive tool called 'MyDoc' and is putting all of its documents in there, so they can be accessed from any PC.

This includes well proposals, top surface maps, deviation surveys, core analysis reports, master logs and mud logging reports, composite logs, end of well geological reports, strip logs, drilling reports, production and well status information, completion sketches and legal agreements archive.

Many different employees are involved in creating the documents and they need to put them together in standard ways so that the whole system works together. "We are building a cathedral and everyone must know how to carve his own stone," he said.

As housekeeping, IEOC tells employees that they should not consider their work to be completed until the reports are archived.

The system provides the information which is necessary in project management.

"Expectations are - to know what the sources of data and information are, to know where the information is and how to retrieve it," he said.

"You have to re-use past information - and do all this efficiently."

"We ensure whatever is developed is owned by the user. The user must participate in this."

"This is a never ending project. It needs discipline, accuracy, perseverance and continuous learning habits," he said.

IEOC spent \$35,000 on document scanning, \$3,000 on the primary server, \$12,000 on its document replication server in Milan.

Responding to questions about how IEOC archives e-mails as part of the system, Mr Rechchad said that employees do not write important information in the body of their emails; the information is on the documents which are sent as attachments.

Another archive is kept to record any decisions which were made, including all the information which was available and who had the authority to make the decision.

## Inger Fjærtoft, NPD



Inger Fjærtoft, chief engineer with the Norwegian Petroleum Directorate (NPD) talked about how the Norwegian government is encouraging its oil and gas companies to use information technology tools to make sure they make optimum use of their oil fields and maximize ultimate recovery.

It believes that closer integration of operations could mean as much as Eur 30bn additional value for Norway. "It has a huge economical and safety potential."

"It is urgent," she said. "We need to avoid squandering resources. Many fields have reached tail production."

NPD also wants to ensure Norway leads the world in oil and gas IT competence.

NPD established a forum, called 'e-drift', with representatives of oil companies, IT companies, labour unions and authorities, to work out how best to do this, increase everybody's knowledge and work on common issues. "Every group has to be able to answer 'what's in it for me'", she said, and bear in mind the different perspectives and priorities of the different groups.

Norway has considered giving the role of operating the digital infrastructure for Norwegian oilfields to just one company.

NPD feels that the challenge is more about people issues than anything else. "People issues are harder," she said. "We are slow to implement new technology and new ways of working."

NPD has studied other industries with remote working. "We need to find out, how do you manage a virtual organisation and have better and faster decisions," she said. "You need new business models and contacts – closer supplier – supplier relationships."

Norwegian research organisation SINTEF was asked to look at the changes that would happen due to more information technology being used. SINTEF estimated that a third of offshore personnel could be located onshore.

For example, maintenance personnel could be given the task of managing the maintenance of specific items in more than one installation, she said, and having expert support all the time from shore. Suppliers might take over more maintenance tasks.

"Some people regard continuous support from shore as an advantage. Others feel they lose influence."

Ultimately the utilisation of work will increase. "We will move from hierarchies to virtual teams," she said. "Authorities methods will change and have to change."

"The consequences for employment are that new jobs will be created onshore," she said. "Suppliers have bigger responsibilities."

"The knowledge per barrel will increase. There will be a greater need for employees in high technology. The sector will be more attractive to new generations."

"There will be closer integration of disciplines production, well control and management, drilling and reservoir management," she said. "Onshore collaboration centres become focal points for competence."

"We will have to work together. No-one can solve the problem from their offices. New working environments will create insecurity for some people."

"People will have to live closer to operations centres – more people will move to Stavanger," she said. "We will see an increased standardisation of instruments, processes and responsibilities."

Ms Fjærtøft was asked if she thought that it was a possibility that Norwegian oil platforms could be run from onshore collaboration centres in India, because India has more engineers. "It is a possibility," she said. "Many Norwegian suppliers have offices in India."

"But what they experience is that Indians are better at some parts, programming and engineering. But for some part of the project planning, Norwegian competence is better. It is possible to go both ways."

"We will develop new meta-competences – the ability to 'reflect' on your knowledge," she said.

"Norway has a culture for co-operation and voluntary work which is different to some other countries," she said. "We are trying to be active and supportive."

"We need new work processes and to understand the need for change," she said. "The university and education system must be involved."

## ***Tim Peregrine, Halliburton***



Tim Peregrine, Project Manager, Halliburton/Landmark talked about the real time operations centres which Halliburton is developing in its Landmark visualisation technologies group.

“Real time operations centres allow expert groups to support multiple rigs,” he said. “You can incorporate more people into the decision process.”

“The people are there, ready for action – there is no time delay for them to get anywhere,” he said.

The most important factors in developing real time operations centres are finding the people and getting them used to this way of working, as well as putting reliable secure data links.

The people have to work together and not follow their own agendas. “Its not 'bleeding edge technology' or 'bleeding edge ideas', but difficult to make sure it is managed,” he said.

Mr Peregrine estimated that better collaborative working could lead to a potential increase in reserves of 250bn barrels in 5-10 years, and an increase in the total amount of oil and gas recovered by 15 to 30 per cent, as well as reductions in lifting costs.

There is also a reduction in non productive time and reduced risk.

### **Matthew Owen, BT**



Matthew Owen, head of oil and gas industry marketing, BT, talked about how BT is developing fibre optic technology which could be useful in the oil and gas industry.

“We spend quite a lot of money and time in communication technology,” he said. “We lead the world in this.”

Any pressure, temperature change or even sound on a fibre optic cable changes the way light passes through it, and so very sophisticated tools can be developed.

With a fibre optic cable down a well, it is possible to measure temperatures every metre along the well at 0.1 degrees accuracy.

This is a useful tool for pinpointing where oil is entering the well, because it expands and cools as it does so, increasing pressure and causing changes to the temperature.

Fibre optic cables can be used as a security tool, because if there is any interference (vibration) near a fibre optic cable, the light pattern changes.

This listening capability could be used for many things. For example, a fibre optic cable around a pressure vessel could ‘listen’ for any sign which could indicate a possible leak. It could also ‘hear’ a valve closing, proving a secondary reassurance that the control system is working.

The fibre system could also immediately detect sand production in a well, because the sand makes a large amount of noise, which would affect the light pattern through the cable.

Fibre optics are safe to use in hazardous environments, small, unobtrusive and simple to install.

### **Robert Mainguy, Alcatel**



Robert Mainguy, director business development and marketing, oil and gas, with Alcatel, talked about some of the developments with data communications services in the oil and gas industry.

“The communications infrastructure is at the heart of this process,” he said. “It takes data from sensors in the field.”

The common communications options are VSAT, getting 1.2mbps over unlimited distance; Microwave, with communications up to 80km at speeds of over 155 mbps; WIMAX at distances up to 15km with speeds up to 25 mbps; and fibre, going over unlimited distance at data speeds of tens of terabits per second. “They all have their role,” he said.

WIMAX might be used more in the oil and gas industry, for communications between platforms close to each other, or with nearby vessels. Alcatel is installing a WIMAX system on a Floating Production Storage and Operations (FPSO) unit for Total in Nigeria.

For fibre optics, Mr Mainguy said that the benefits were high reliability and independence of the weather, but there can be problems if the cable is not buried deep enough and hit by a ship.

Mr Mainguy recommended create a fibre optic ring, so there's always another data routing option if there's a break in the cable anywhere. "Its future proof – there's no bandwidth limitation," he said.

Alcatel has put together a subsea monitoring system off the West Coast of Canada using fibre optic cables, and could do this for the oil and gas industry, he said.

## ***Sense Intellifield***

Ketil Barkved, vice president of sales and marketing, with Sense Intellifield, talked about his company's work to put together operation collaboration centres for the oil and gas industry, and managing the associated data communication.

Sense Intellifield has over 100 such systems, with clients including BP, Shell, Maersk, Aramco, Statoil. "We design, purchase, engineer, install and commission. It's a combination of consulting and product," he said. Normally it takes about 6 months to install a system."

"They are decision environments – people can work together in a better way, in cross discipline groups," he said.

One reason for installing collaboration centres is people leaving. "We need to use expertise in a new and better way," he said.

"The tools are getting more complex," he said. "Experts need to pull data from different databases – there's manual work and errors."

"We believe working in real time will help. You can get information and advice in real time, make decisions in real time and carry them out in real time."

In the past, a drilling operator could have had up to 6 separate screens, one for each of the service companies being used.

Now service companies are emerging which can take all the data and put it together, with all the data being delivered in electronic standards such as WITSML, he said. The data can be displayed in useful ways.

The toughest aspects are getting the systems implemented, he said, and his advice was to make sure the technology is easy to use.

"Integrate the different information services – CCTV, rig radio, real time data, video. Make it robust and flexible," he said.

"Spend money, buy good equipment and integrate it. Make this a living situation," he said.

Mr Barkved was asked how he persuades all the companies involved to provide all of their data in a standard format, when many people want to keep their data close to them.

He replied that the Norwegian government has proven very helpful in forcing this. "In Norway, the service companies are contracted to supply data in WITSML standard," he said.