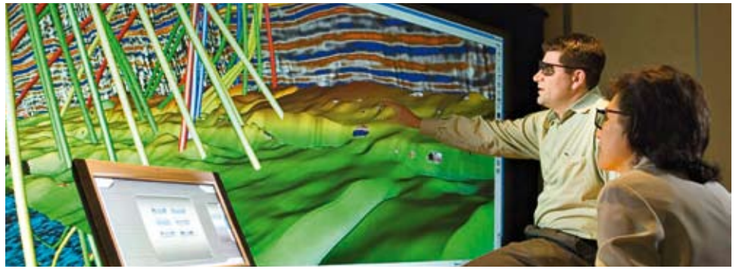
Platform network for oil a-v

Always-on network technology and a-v systems are enabling the oil industry to explore and extract faster and more safely, says *Geny Caloisi*



A Halliburton room installation for Skarpet (top) and 3D visualisation techniques in use (centre)

ROOM HARDWARE

The following kit list was used in a typical oil collaboration installation, in this case a land-based one for Shell's Port Harcourt facility:
10x NEC 46in LCD monitors
Crestron TPS-4000 10.4in touch panels and Pro2 control processors
Extron 12800 RGBHV matrix switcher, audio matrix, cables and computer
Beyerdynamic table mics
Tannoy ceiling speakers
Crown stereo amplifier
Middle Atlantic racks and panels

Oil is one of the richest industries, but part of its wealth comes from the clever use of technology. In a few areas, especially those related to collaboration, the oil business is in pole position.

Finding oil is not a simple task, especially when the extraction has to be carried out in the middle of the ocean. The manipulation of the raw 'black gold' can also be dangerous, with it being a flammable substance extracted by using elaborate pressure systems. Having accurate real time control of what's happening underground, underwater, deep in the sea, is key to a smooth operation.

Finding a fat oil pocket is not an exact science either. Although research will be carried out and calculations made to find where the next extraction will come from, finding the right spot in the sea floor is a bit like fishing. The floating platforms will try one place and if there is not enough oil for it to justify staying, the platform will move.

On many occasions, a Floating Production, Storage and Offloading vessel will cruse between the platforms, taking the oil or gas produced from a nearby platform(s), processing it, and storing it until the oil or gas can be offloaded onto waiting tankers, or sent through a pipeline.

The stages for oil and gas well operations can be divided into five segments: planning; drilling; completion (when the oil or gas is actually being extracted); production and abandonment (when the well is dry), and the industry is making increasing use of a-v technologies during these stages to help speed up decision making and improve safety.

Halliburton has been working with the oil industry since 1919 and it has been instrumental in the adoption of advanced collaborative environments. A subsidiary of Halliburton, Landmark, creates software and product services specifically tailored for the oil industry.

Landmark's software allows visualisation and real time operation monitoring, both key to efficient multidisciplinary well planning. Technologies critical to the process include Landmark's AssetView software, which provides the common 3D visualisation environment for subsurface and drilling data, and Compass and TracPlanner applications for designing well trajectories. It also produces OpenWire software, which feeds real-time information into the OpenWorks data repository for use by geoscientists, who can then calibrate and update their models on-the-fly.

The company also develops software for well drilling and 24/7 well monitoring.

A-V and extraction

A typical setting for oil extraction would be to have a main office on land and some satellite control rooms at the maritime bases. All the systems need to be efficiently and reliably connected to each other, normally over the oil companies' private networks. The land operation normally has a big meeting room and a smaller room for up-to-the-minute specialist monitoring. These smaller rooms will be replicated on the ocean bases.

For a long time, each of the sea-based platforms needed their own specialists to control the oil extraction activity and be ready to act on emergencies. But this is very expensive and there are also not that many specialists available.

Tim Peregrine, consulting manager at Halliburton, comments that one big issue this industry is facing at the moment is the aging of its specialists and the lack of new ones coming to replace them — so using a-v to maximise their productivity is vitally important.

UK-based a-v specialist Pixel Projects is currently working with Halliburton to connect 18 sites. Its sales director, Paddy O'Brien, explains that for each sea oil platform there will be an on shore computer which will have 'every conceivable bit of information from the platform.

'This information goes straight to LCD screens where it can be displayed for the monitoring specialists to see and share.'

Each operating parameter, such as pressure or temperature, will have a specialist technician or scientist reading the results and checking that everything runs smoothly from the off-shore platforms.

Pixel Projects is working with Halliburton to achieve an efficient collaborative environment where, through videoconferencing, display »

KEY FACTS

Always-on network technology and a-v systems are helping the oil industry make extraction and exploration faster, safer and more efficient.

Les systèmes audiovisuels et la technologie réseau Always-On aident l'industrie pétrolière à accélérer, sécuriser et optimiser l'extraction et l'exploration.

AV-Systeme und eine „Always-on"-Netzwerktechnologie helfen der Ölindustrie, Erdölvorkommen schneller, sicherer und effizienter zu erschließen.

- www.accessgrid.org
- www.insors.com
- www.halliburton.com
- www.pixelprojects.co.uk
- www.tandberg.com

VIDEO BOOSTS STATOIL

Norwegian oil and gas company Statoil has integrated the operations of several major production platforms in the Norwegian Sea and built a single, advanced support centre for them on the rocky Norwegian coast.

This new Onshore Support Centre, at Stjørdal near Trondheim, is a real-time data monitoring and videoconferencing hub.

In addition to banks of computers and a virtual-reality reservoir simulator called the Visionarium, the centre is full of Tandberg videoconferencing equipment.

Six Tandberg 6000 systems are in use, and there are plans to add four more.

'Simply put, we wanted to build a centre that would allow us to make better decisions, faster,' says Statoil employee Svein Omdal. 'We wanted a good-quality, robust and flexible solution.'

Statoil's high-bandwidth videoconferencing systems let shore-based engineers consult both with platform personnel – who are similarly equipped– and with problem-solving experts elsewhere in the world who might otherwise have to fly to Trondheim and helicopter out to the installations in person.

Statoil has 19,000 employees and operations in 28 countries, and is one of the world's largest net sellers of crude oil. Despite its growing international footprint, most of Statoil's revenues continue to come from producing oil and gas on the Norwegian continental shelf, where it operates numerous offshore fields.

Three of those fields – named Heidrun, Kristin and Åsgard – are now linked by fibre optic cables that reach as far as 300 km to the new Onshore Support Centre.

Since that facility opened, engineers, geologists and others have been able to monitor real-time changes in temperature, pressure and other conditions at the tip of a drill string far below the sea floor in the middle of the Norwegian Sea. The sensor data is used to determine where to drill next. According to Omdal, such real-time data transfer in conjunction with expanded video collaboration will have considerable impact on Statoil's long-term revenue.

«technologies and clever networking (including flat screens, videowalls and Cyviz 3D projection), oil companies can get speedy and safe results.

The smaller control rooms will have a desk for each specialist, who will sit in front of at least two screens displaying the information gathered from the sea bases. These screens will also be linked to bigger screens on the walls, where other people can take a look at the data without crowding the monitoring desk. The workstations are all fitted with cameras to allow visual communications. Many of the oil companies use the Iocom InSors Access Grid for visual communication, which is a software based system that runs over a secure network. The Access Grid is an ensemble of resources including multimedia large-format displays, presentation and interactive environments, and interfaces to Grid middleware and to visualisation environments. These resources are used to support group-to-group interactions across the Grid, working over H323.

These control rooms also use traditional videoconferencing units, in particular for the bigger meeting rooms.

When something is not quite the way it should be, or the well enters a new stage, bigger group discussions are carried out in the larger of the meeting rooms. These will include specialists and also people from the insurance company to make sure everything is carried out the way it should be. That's when special visualisation equipment, such as Cyviz 3D projection, will be used. Having 3D images allows scientists, even if virtually, to get closer to the bases, and get a better perspective and proportion of the problem to be solved.

Cyviz 3D screen in a Halliburton room installation

For instance, StatoilHydro's support centre in Bergen, Norway, uses a four channel rotated Cyviz Bizwall together with four F30 projectors deliveringa 4.4x x by 1.9m, 4,500 pixel image.

The systems are all duplicated on the grid backbone in case anything goes wrong, 'Every rack and system is doubled up in case of emergency, if one fails the other one can start working,' says O'Brien. 'All the a-v equipment is connected to the oil company's network, to allow for remote monitoring, but it can also be accessed through the Crestron room control panels and CresNet.

With the help of the advanced a-v technology, plus clever planning and design, the oil industry can rest assured that it will get the best results it can. ■

GEOSTEERING

During the process of drilling a borehole, geosteering is the act of adjusting the borehole position (inclination and azimuth angles) on the fly to reach one or more geological targets.

These changes are based on geological information gathered while drilling. From 2D and 3D models of underground substructures, deviated wells are planned in advance to achieve specific goals: exploration, fluids production, fluids injection or technical.

A well plan is a continuous succession of straight and curved lines representing the geometrical figure of the expected well path, and is always projected on vertical and horizontal maps. ■