

Oil and gas facilities provide tempting targets for terrorists or saboteurs. Tom Frame explains how the latest IP video security systems can help protect vulnerable and isolated facilities

Organisations within the oil and gas sector face a number of unique challenges that may seem to be easily addressed by IP video security systems – such as IP video cameras, network video recorders (NVRs) and video security management software applications. But as we will see, due to the unique nature of the oil and gas sector many IP video security systems simply cannot provide a solution to these challenges.

Many oil and gas organisations have global coverage, with multiple sites that are often remote. One of the biggest benefits of IP video security is that, in theory, a security camera could be viewed from anywhere. Someone based in a head office could watch live video from any site – irrespective of distance. This has become more pertinent with recent terrorist attacks on remote oil and gas facilities. Organisations with no access to video security when an attack occurs are blind to what is happening, and often have to rely on third parties,

such as police or news agencies, for information.

Of course, a challenge faced by the oil and gas sector is that many sites are extremely remote and have very limited network connectivity – such as satellite network connections – giving very low bandwidth for data transmission. This can be seen as a block to deploying an IP video security system, but with the right camera design features it is possible for an IP video security system to overcome the highly limited bandwidth available for data transmission.

The first camera design feature is to deliver excellent video compression – that is, to be able to reduce the network bandwidth required to transmit the camera video. Video compression has improved significantly over the years, with the H.264 compression technology being the most commonly used technology. But one of the issues involved with H.264 is that, as a standard, it does not set requirements for just how good the compression,



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or video quality, is. That means two cameras from different manufacturers may both have H.264 compression, but will both have completely different bandwidth requirements to transmit the exact same picture. This factor has led to confusion in the security industry, with many believing it isn't possible to transmit great quality video over a limited bandwidth connection. That simply is not true; it comes down to testing the camera's capabilities beneath the label stating the camera has "H.264 compression".

In addition to having excellent video compression technology, the second camera design feature that helps with remote video transmission is the ability to transmit multiple video streams at different quality settings. This feature means that not only is it possible to transmit a video stream remotely, albeit at slightly reduced frame rate and quality, it is possible to record extremely high quality evidence on a networked video recorder near to the camera. This feature is extremely important when dealing

with remote video transmission; if only one video stream is available then the recorded video will be affected by the remote network connection. It is also imperative that both streams be completely independent of each other.

A factor that must also be taken into account is the NVR's ability to buffer playback to remote locations, allowing remote operators to view the high quality recorded video. This high quality video, both live and recorded, are key requirements for security operations within the oil and gas sector. But another key area that is often neglected is the ability to have smooth pan, tilt and zoom (PTZ) movement for operators. This becomes particularly challenging when dealing with remote sites – latency often becomes an issue making camera operation difficult.

When choosing the right IP video platform, PTZ latency is a factor that must be taken into consideration. What is the real latency from when an operator attempts to move a camera and when the camera actually responds to that request? Many IP



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PTZ cameras have poor PTZ latency, resulting in anything from 500ms to two-second latency, making cameras unusable by remote operators. The lower the PTZ latency, the more usable the cameras will be.

As we have discussed, oil and gas organisations often have global coverage, with hundreds or even thousands of sites. A significant challenge is having an IP video system that can scale up to that magnitude. The majority of IP video security systems have not been designed with true scalability in mind, often mimicking analogue video security design which in turn can cause major scalability issues. One of the biggest design flaws comes when IP video security systems require management server hardware – mimicking the analogue matrix approach. This design flaw usually comes from poorer camera and NVR technology, meaning an additional management server has to carry out administration tasks that should be performed in the camera or NVR.

By having management servers in the overall security system design, scalability becomes more difficult, particularly over multiple sites. Where should the management server be located? At the remote site, near to the cameras, or at a centralised monitoring location? If network bandwidth is limited, the only feasible location is to have a management server based in each site – which can dramatically increase total project costs.

Another flaw in having management servers is that they provide a single point of failure in the system. If a management server responsible for a particular site goes offline, the whole video security system will go offline. It is possible to overcome this issue by having a redundant management server, but again this adds even more to total project costs.

These costs can be spotted early in the project design, but one hidden cost that is often not considered is that of the video management aspect. As discussed earlier,

one of the biggest benefits of IP video security is that, once networked, a security camera can be viewed from anywhere in the world. One of the other benefits of a networked camera is that it is possible to have any number of people viewing that camera, simultaneously. That opens up the possibility of other departments viewing cameras once they have been granted the correct access permissions. For example, human resources can now assess skills remotely and health and safety can carry out remote assessments – all greatly reducing administration costs for the organisation as a whole.

Unfortunately, the majority of video security management software applications have user licence costs – that is, a licence fee must be paid for every additional computer with the software installed. Every time an additional department wants to access the cameras, software licences increase. Even with the addition of remote operators, software licensing costs again increase. These increased costs often negate any benefit made and can act as a major barrier to adopting an IP video system.

There are some video security management software applications that have a “client licence-free” structure, meaning there is no cost when giving access to any additional departments or operators. In order to get true scalability with no hidden future costs, it is imperative to have video security management software with a “client licence-free” pricing structure.

As you can see, there are a number of challenges facing oil and gas organisations when moving to an IP video security system. There are manufacturers that have developed solutions that can solve those challenges, however, and if a security management professional in the oil and gas sector knows the right questions to ask, they should have no issue in finding an IP video security solution that answers those demands.

Off-site security: IP surveillance systems allow users to monitor remote facilities from local control rooms or offices around the world

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