



Pierre Schäring and Per Lundmark show how all kinds of images can be transferred freely between monitors of any size.

Control rooms of the future are already being built in Borås

The operator finally owns the large screen monitor and becomes part of the process

Suddenly a process event requires the operator's undivided attention. It's vital to stay alert. The operator needs immediate access to all important information about what's happening without needing to change between several monitors. It's equally important to have all tools close at hand.

Just as expected, the correct information automatically appears on the monitors where the operator needs it most. And that's not all: the operator desk

is automatically raised so that the relaxed sitting operator is now working upright and is quite literally 'up and doing'. At the same time, colder air is ventilated around the work station to also act as a stimulant. The ceiling lights change colour to red to warn people outside that now isn't the best time to come in and chat about the weekend's football matches. And the operator can concentrate on working on the room's sole keyboard.

The intelligent control room

In order to work efficiently, the operator needs to be part of the process, not an on-looker; the control room is transformed into the operator's direct production interface. But this implies a new type of intelligent control room which truly is an integrated part of the process.

While it may sound like science fiction, the intelligent control room already exists. A work station where process images are not just in direct contact with all conceivable aspects of production but with everything in the control room: the actual monitors, the desk, lighting and ventilation. The work station must also be adapted to the operator's needs to allow him to become an efficient part of operations. And to enjoy his job.

"The need for an operator to work efficiently is obviously not confined to crisis situations; it is a high priority in day-to-day work as well," Pierre Schäring points out.

"A huge amount needs to be done to improve the operator's working situation."

Avoid moving from monitor to monitor

Pierre Schäring is CEO of CGM in Borås, Sweden. In a joint venture with ABB, the company has developed a new type of control room equipment. A work station directly connected to the process and its control system in order to provide all the information the operator needs to perform his tasks in the best way.

A common problem for today's operators is the need to keep an eye on so many different things, ranging from process data, via surveillance cameras at different places, to the weather at plant locations. And things often get complicated because different information usually has its own systems with dedicated monitors, keyboards and procedures. To be certain of obtaining a good overview, the operator has to move between these different systems; apart from anything else, this presents an ergonomics problem.

Pierre Schäring contends that this shouldn't be necessary. And his company has proved this by creating a work station where the operator has integrated contact with the process and all other information needed in every situation.

Transfer information freely

CGM is the Borås company that manufactures workplace furniture, such as control room desks. But a few years ago,

they started to take things to another level. Control room furniture could be something more than just a place to stack all the information systems. It could be an active part of the process.

The basic principle for the new EOW-x work station is that the operator has one integrated way of retrieving information. All types of information can be displayed on the same large or small screen monitor as the operator chooses. And everything can be managed using just one keyboard. But just because it's possible to display everything on one monitor doesn't mean that the work station is only equipped with one monitor. There is a mixture of large and small screen monitors. However, all monitors have the same aspect ratio (different sizes but the same 16:9 proportions) and the same resolution. This means that images can be transferred freely between monitors according to the operator's preferences, no matter what size.

"This is the first time that the operator really owns the large screen monitor," explains Pierre Schäring.

"Usually operators never look at the large screen monitor. It's usually just for the benefit of people visiting the control room, while operators perform all tasks on the small monitors. Now they have the option of placing all types of information in the most suitable place."

Audio shower doesn't bother others

The monitors are capable of displaying all types of information. Process information is obviously very important. The system is linked to ABB's System 800xA and its viewing system, which means that clicking the image displays information about the object from the preferred aspect. This includes operating data, as well as maintenance information or technical data.

But monitors can just as easily display images from a surveillance camera far away, information from the Swedish Meteorological & Hydrological Institute about the weather or show the opposite party in a video conference.

Everything can be transferred between monitors. But audio has an important function and the work station has two audio systems, one for the operator and a general one for other people in the control room. Everything is integrated with process control.

Directly above the operator's work station, there's an audio and lighting box. In



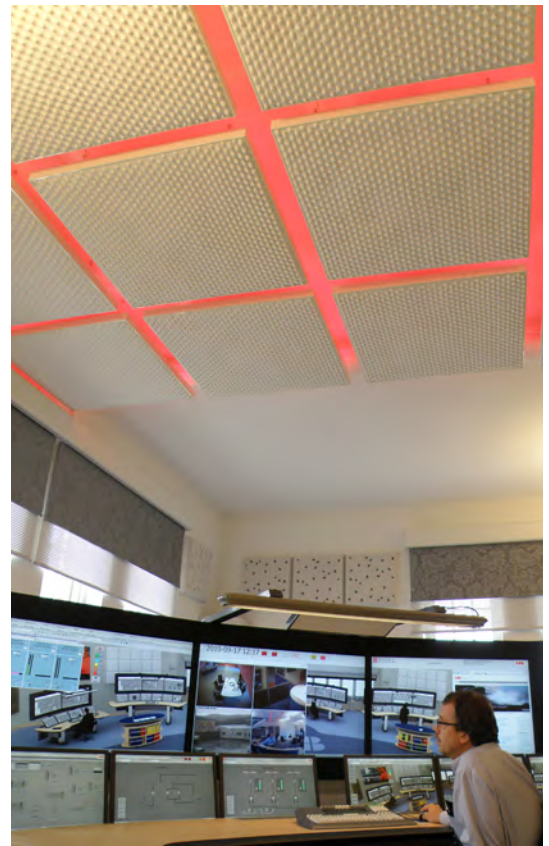
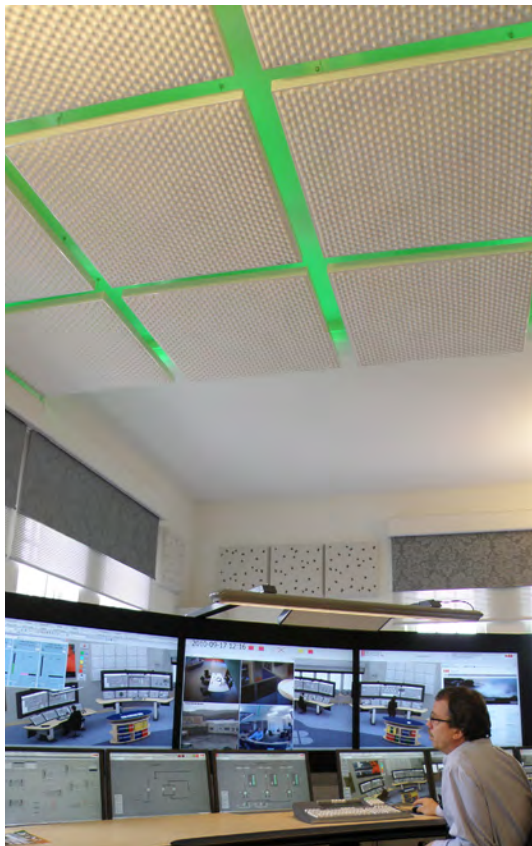
Pierre Schäring, CEO of CGM



Per Lundmark, ABB Manager for the eow-x system.

Quick facts

- CGM and ABB have developed a new control room work station.
- All information can be displayed on the same monitors; multiple computer systems are not necessary.
- Images can be freely transferred between large and small screen monitors.
- Other functions can be controlled from the process system, e.g. desk height, lighting, sound and ventilation.



In addition to workstation lighting, there's a loud speaker angled down towards the person sitting beneath. This provides an 'audio shower', as Pierre Schäring puts it. The sound only reaches the person sitting at the workstation and doesn't disturb other people in the room. For more general audio information, such as announcements or alarms, there's a loud speaker system by the large screen monitor. There's also a camera system for video conferences.

Large and small screen monitors

The large screen displays consist of two or three 52-inch monitors depending on specific needs. The control desk, where the operator works, has space for four or six smaller 23-inch monitors. There is also one keyboard which is used for all tasks so the operator doesn't have to move from one keyboard to another for different systems and tasks. The operator should be able to do everything using one keyboard without having to move. And information, from whatever source, is displayed on the monitor selected by the operator.

An operator normally works alone at his workstation, so the desk is primarily adapted for just one keyboard. But it's possible to connect another two if more people need to work there temporarily.

The operator needs variation

The first impression this arrangement gives is one of ordinary control room furnishings without the usual muddle of monitors and keyboards. But there are countless options for adapting the

environment according to operator preferences and the requirements of any given situation. The large screen monitors can be raised and lowered. The small ones can be moved backwards and forwards, and can be positioned at different angles. Everything is customised for the operator.

"It's a good idea to change the position of the monitors during the shift to provide variety for the operator," Pierre Schäring notes.

These settings, like the monitor displays, can be controlled by the operator. But they can also be controlled by the process. This is because the entire workstation is integrated with ABB's System 800xA, so what's happening in the process may affect the entire workstation. A lot has already been achieved and there's a lot more in the pipeline.

Micro ventilation

Micro ventilation means that the temperature around the workstation can be varied according to the operator's preferences, regardless of the temperature in the rest of the control room. It's even possible to have one temperature above the desk and another down on the floor for someone who suffers from cold feet. This function still needs some fine-tuning but is under development in a project supported by Vinova [Sweden's innovation agency].

It should also be possible to open and close the control room's curtains from the workstation – if it's lucky enough to have windows. The ability to control the ceiling lights is another option. The ceiling lights should also change colour



automatically according to the working situation.

Reduced number of operators

CGM and ABB are demonstrating that a lot can be done to streamline control room work. And this is something Pierre Schäring considers to be important. There is a clear trend towards fewer and fewer operators with greater and greater responsibility. In the light of this, it's essential to ensure that their work is made as easy as possible.

Frequently, the control room is located far away from the actual process, sometimes very far away indeed. This is the case with offshore oil drilling with an onshore control room. Or it may be hard to find qualified workers willing to work at a facility out in the jungle and so operations have to be controlled and monitored from a town where it's easier to find the right personnel.

Several facilities may share one and the same control room.

"If there's a considerable distance between the control room and production, it's vital that the operator has access to all operational information. Even knowledge about the weather is significant to someone who isn't actually at that location."

Based on feedback

Pierre Schäring is convinced that the EOW-x work station is bang on-trend.

"Interest in efficient control room work

is increasing all over the world and the market is positive."

The new innovations are often the result of customer feedback.

So far, CGM and ABB have sold thirty work stations of this type. The largest delivery to date has been to a copper mine in Chile. In Sweden, there's currently one facility up and running at Akzo Nobel in Örnsköldsvik. There are also demo facilities, like the one at CGM in Borås.

Easier to attract young people

Pierre Schäring is convinced that the work station increases operator efficiency and minimises operator mistakes. But it would be good to have real proof of this. It's particularly important to have these figures outside Scandinavia. A joint project is in progress with Chalmers and the SP Technical Research Institute of Sweden to produce figures to show how efficiency increases.

And then there's an entirely different aspect that Pierre Schäring points out.

"It's currently difficult for industry to find qualified operators. Better work stations will make it easier to attract young people to jobs like this. And get them to stay."

Dag Toijer
(text and photos)

All functions are controlled from just one keyboard. Only one is needed.