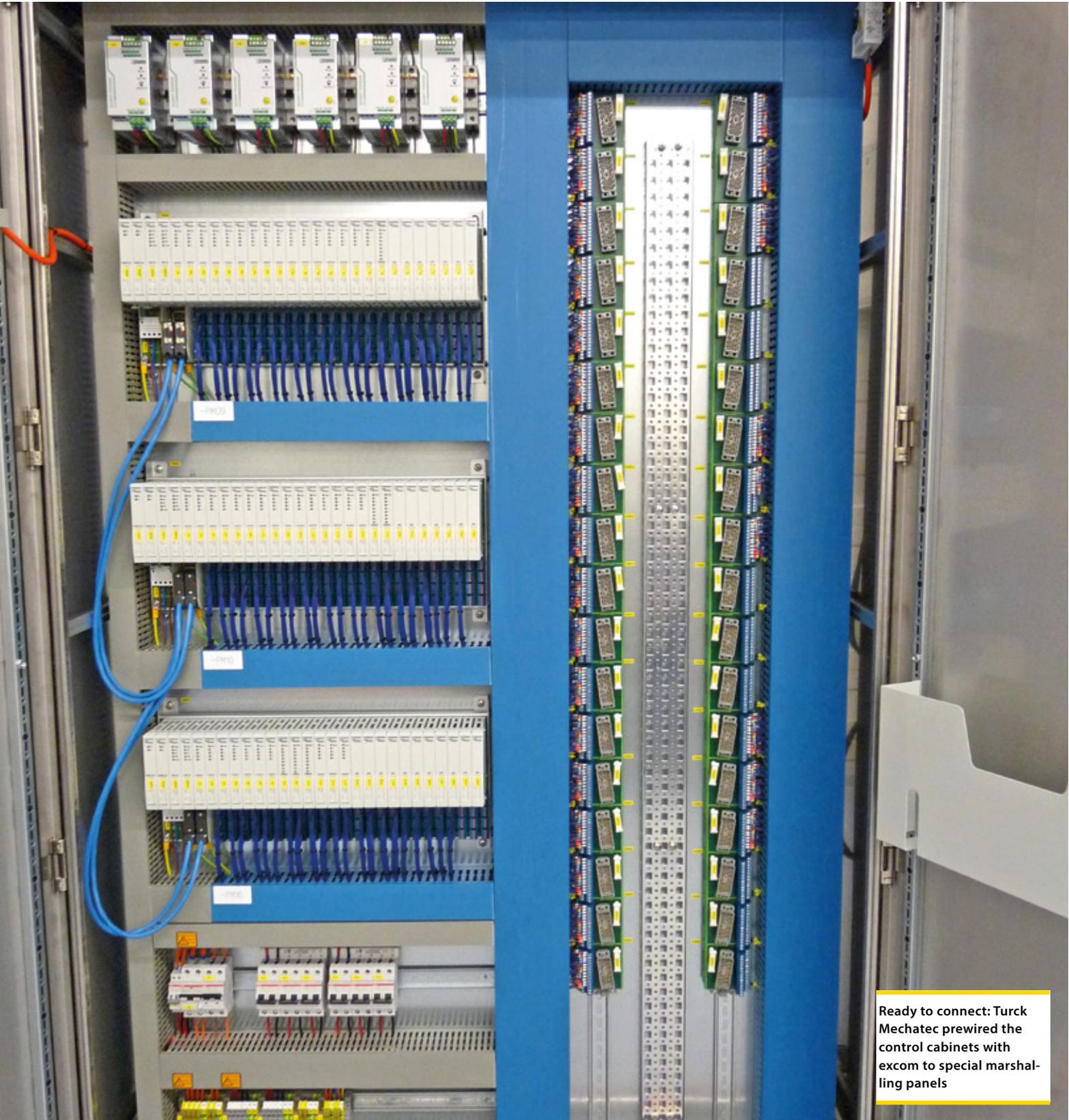


# Make Space!

At Chevron Phillips Chemicals International NV, Turck's excom system is replacing the I/O level with Ex isolation and is consequently saving a lot of space in the I&C rooms



Ready to connect: Turck Mechatec prewired the control cabinets with excom to special marshalling panels

CPChem plant in  
Beringen, Belgium



Anyone who avidly follows the technology and IT press would have already read the swansongs to the smart-phone that went around a few years ago. Even well-respected CEOs from Silicon Valley have recently predicted that its time had come. Data glasses, smart-watches and digital assistants, such as Amazon's Echo as well as similar devices are often mentioned as successors. Technology migration makes space for new innovations – one characteristic that the consumer and industrial B2B business have in common. When existing device types are discontinued or become unnecessary, their function, i.e. what they performed for a plant or machine, has to be taken over by a different device.

Brownfield projects in the chemical industry can also be considered in the same way. At petrochemical company Chevron Phillips Chemicals International NV, Turck's excom today replaces the previous I/O system and the Ex isolation in the same housing. This creates space in the I&C room for plant expansions and for innovative technologies. The plant in Beringen belongs to Chevron Phillips Chemicals International NV (CPChem) since the end of 2011. It was founded in 1991 by the Finnish refinery Neste. The Beringen plant focuses on the manufacture of polyalphaolefins (PAO), which are used in synthetic oils and lubricants. These oils are primarily used in the automobile industry and other industrial sectors.

When the Finnish manufacturer discontinued in 2013 the I/O system used in the control cabinets in Beringen for the Honeywell control systems, the engineers in charge at Chevron Phillips International NV looked for alternatives for the I/O system used. They looked for a system that could be linked to the Honeywell control system via Profibus DP and provide the Ex isolation of the signals, i.e. supply both intrinsically safe and non-intrinsically safe devices. It also had to be a flexible system that supported the latest in diagnostic functions and open standards. The new I/O level also had to take up as little space as possible and not affect the availability of the plant.

CPChem first of all asked Honeywell whether they could recommend suitable I/O systems to replace the existing system. Honeywell gave its recommendations, which included excom. Several projects worldwide already testify to the excellent collaboration between Honeywell and Turck – equally in terms of the collaboration between their employees and the interaction between systems used.

#### Pilot project

CPChem first of all rolled out a pilot project with one control panel, in which the I/O cards were replaced with

an excom rack. This was for the intrinsically safe signals for field devices in Zone 1 or 2.... As the pilot project proved to be successful, follow-on projects with excom were planned. Initial finding of the pilot project: Excom saves a lot of space. Other systems require a separately located Ex isolation for the signals in Zone 1. With excom, signal processing and Ex isolation are integrated in a single housing. After the pilot project, it was clear to CPC that they only required three control cabinets with excom to replace five control cabinets with devices of the old system.

After the successful pilot project, CPChem replaced a total of 172 I/Os in 2015. This time, the space benefits of excom were fully utilized. The replacement of the I/O cards was planned so that entire control cabinets became unnecessary. This space is now available for plant expansions or the installation of additional technology. In the follow-on project in 2017 other I/O

#### QUICK READ

The I/O system used on the Honeywell control system in Chevron Phillips Chemicals International NV (CPChem) Belgian plant in Beringen had been discontinued by the manufacturer. CPChem identified Turck's excom as the I/O system best suited to replacing the previous system. Turck Mechatec prepared the fully prewired control cabinets with excom racks and special marshalling panels for CPS, which could be commissioned on site very quickly. Today, excom saves considerable space in the I&C room because it integrates the separate Ex isolation that previously took up a lot of space. The fact that all I/Os are operated in the same way, regardless of whether they are in Zone 1, 2 or the safe area, is another benefit.

»A lot of preparation work could be done in advance. This was a considerable benefit. We were able to work by plug and play as we did not have a lot of time. The actual installation only took one to two days.«



Sarah Gyssels | Chevron Phillips Chemicals International NV

cards for 720 signals were connected via excom.

**Fast connection to the existing control system**

The time available for installing the I/O technology was short. Although the Beringen plant has a turnaround with a length of maximum 14 days every two years, more than just the physical installation had to be completed within this time frame. The new devices also had to be commissioned and their interaction with the overall system thoroughly tested.

It was a great advantage that Turck could supply fully prewired control cabinets, which were fitted with both excom and special marshalling panels that CPChem had previously used. Turck's own service provider for custom solutions, Turck Mechatec, assembled the control cabinets prewired and ready to connect with the marshalling panels. This considerably shortened the installation time for CPChem since it was possible to retain all the field cabling.

A service provider for CPChem just had to erect the control cabinets and connect the cables to the correct terminals. "A lot of preparation work could be done in advance. This was a considerable benefit. We were able to work by plug and play as we did not have a lot of time. The actual installation only took one to two days. However, the tests still had to be carried out afterwards," explained engineer Sarah Gyssels, who also described the site acceptance test (SAT) and factory acceptance test. While the FAT was carried out at Turck Mechatec prior to installation, the site acceptance test had to be carried out in the plant after the installation. This often takes longer than the actual installation itself.

**One system for all signals**

The entire migration of the I/O cards for the non-intrinsically safe signal has to be completed by 2019. By then, all the 2000 I/Os will be connected through excom. The fact that all signals, whether intrinsically safe or not, are connected via the same system also makes it simpler for operators. Excom for Zone 1, 2 or the safe area use

the same GSD file and the same DTM. Employees therefore only have to become acquainted with one logic and user interface to operate the system. Although HART communication is not currently used by CPChem, the HART capability of excom is important in order to be equipped for later innovations.

**Galvanic isolation also between channels of one module**

Unlike many other systems, the individual channels of a module are galvanically isolated. In the event of external interference, such as through electromagnetic waves, this ensures that this interference is not also transferred to neighboring channels. This makes measuring ultimately more reliable. Short circuits on a module channel also do not have any negative effects on the other channels of the same module.

**Good support**

Anyone who has ever been involved in a retrofit project of this magnitude knows that problems will always occur. The important question for CPChem was therefore how Turck deals with these problems. "Turck swiftly solved any difficulties that occurred," Sarah Gyssels reflected. "We always had a customer contact that really looked after us. The training at the local Turck office was also very useful for us, as everyone now has the same level of knowledge, even the new colleagues."

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