

## Hexion Solves Smoke Detection and Control Room Reporting with Wireless Solution



“We had to find a better way of detecting when there was a problem at our multiple warehouses and communicating this to ensure the safety of our employees as well as improve reporting conditions to our control room. After investigating several hard-wired options we found an easy, flexible and affordable way to meet our requirements and improve smoke detection and increase plant reliability thanks to Honeywell’s wireless transmitters.”

Herman Punt, discipline engineer QMI, Hexion

### Benefits

At its production site in Pernis, Netherlands, Hexion faced dealing with a legacy communication, reporting and smoke detection system. After having acquired this epoxy resin plant from Shell a number of years before, the smoke detection system of several warehouses associated with the plant no longer met current requirements. That, in conjunction with an antiquated system for sending reports to the control room acted as a catalyst for a much needed technology makeover. A wireless system from Honeywell proved to be the answer.

Hexion selected Honeywell’s XYR 5000™ wireless transmitters to improve reporting, meet regulatory requirements and enable real-time detection in case of any incidents.

As a result of working closely with Honeywell and its team of wireless experts, Hexion has been able to recognize the following benefits to its operations:

- Wireless transmitters installed at less than one-third of the estimated costs of the project
- Reliable, immediate and accurate data helped meet and maintain regulatory requirements
- Easy access to multiple warehouse data and improved reporting and communication to central control room for improved safety and performance
- Reduced operational and maintenance costs



Hexion uses Honeywell wireless transmitters for wireless smoke detection and control room communication.

### Background

Headquartered in Columbus, Ohio, Hexion Specialty Chemicals is the global leader in thermoset resins. Hexion serves the global wood and industrial markets through a broad range of thermoset technologies, specialty products and technical support for customers in a diverse range of applications and industries.

As the world’s largest producer of binder, adhesive, coating and ink resins for industrial applications, the company employs more than 7,000 people globally and its manufacturing network serves customers in most world markets. The company has 126 production facilities and distribution channels in 25 countries in America, Europe and South-East Asia.

## Challenge

Hexion's production site in Pernis was originally part of a Shell-owned complex and both smoke detection alerts and possible fire reports were still handled by the incident room at Shell. Because the smoke detection system no longer met regulatory requirements, it was time for a technology upgrade. In addition, an even bigger challenge was an antiquated control room reporting system.

"Up until now in the case of a smoke warning, a manual telephone call was the only way to pass on information to the Hexion warehouses – an absolutely unsatisfactory situation and one that had to be corrected as soon as possible," said Herman Punt, discipline engineer QMI, Hexion. "While investigating options for our smoke detection system, we figured the time was also right to implement a direct reporting system for the control room."

Responsible for the proper functioning and possible replacement of analytical instruments, Punt was assigned to select the necessary equipment for the smoke detection and reporting system for the warehouses.

## Solution

Hexion has three warehouses onsite that must meet safety requirements for the storage of certain chemicals. Because two of the warehouses must comply with stringent explosion safety regulations, fast detection of possible smoke is required.

The warehouses are divided into several zones. Signals from the detectors in those zones are first collected at a smoke reporting unit, outside the building and, from there the status must be transmitted to the central Distribution Control System in the control room, culminating in an alarm message to the process operators working there.

"For sending these alarm messages, we first considered conventional cable as an option", said Punt. "However, in that case expensive cable guiding systems or digging activities were inevitable. Imagine bundles of cables, originating from the three warehouses, into three cable boxes, and from there to the DCS in the operating room of the factory."

The total distance is about 875 yards, and all cables had to be protected fairly well against damage. Because the existing cable lanes were already packed, this would have meant that totally new cable lanes were needed and this wasn't a viable option.

Fortunately, there was a much better alternative: a wireless connection between the smoke reporting units and the DCS-system. After initial research on the wireless field equipment available, Punt contacted Honeywell.

"Honeywell confirmed that it was possible to send the status of the smoke reporting units through the air, instead of building cable lanes, by using its XYR 5000 wireless transmitters. Even better was that we later realized the wireless solution could be implemented for only one third of our originally estimated costs," continued Punt.

Each warehouse zone is assigned its own smoke detectors, which are now physically connected to a reporting unit. Each reporting unit is connected with a cable to a Honeywell XYR 5000 wireless transmitter, of which there are eight in total.

The transmitters send their signal to a central Base Radio, which is placed in a high position in the neighborhood control room. From there, the signal continues its journey through a standard RS485 cable, until it reaches the Distributed Control System.

"Each smoke reporting unit is capable of sending three different alerts", Punt explains. "A smoke alarm, a system failure alarm, and finally a manual alarm so that in case anyone in a warehouse detects a problem, all they have to do is push a button."

In order to reach maximum signal strength, Hexion conducted a field survey to determine the most optimum wireless transmitter placement options. In some cases moving a transmitter only 70 centimetres to the left or the right was enough to increase signal strength. In addition, reliable radio contact between transmitters and receivers was also established.

According to Punt, cables from smoke reporting units to transmitters on the other side of the warehouse, nearer to the receiver, could be skipped from the original plan and this saved Hexion even more money.

Some transmitters are located on a side of a warehouse, where traffic in the form of trains and trucks passes along. Every transmitter has a helical antenna, so the signal is transmitted in all directions. Basically, targeting of the antenna is therefore not needed. However, each transmitting station also has a battery which is placed in the middle, while the antenna is placed on one of the corners. To have optimal transmission, it is best to place the antenna in the direction of the receiver. So, while exact

targeting is not necessary, a correct placement of the transmitter is favourable.

The distance which can be bridged by a standard transmitter is about 600 to 800 meters. To overcome a bigger distance, up to 1500 meter, a yagi-antenna can be used, which sends a cigar-like signal in one specific direction. When repeaters are added, even transmission distances of several kilometres become within reach.

The wireless solution at Hexion is realized in the form of a star network. A frequency of 886 MHz is used, and a band width of five MHz. This is enough for the 15 to 18 transmitters in use at this site.

The network is secured by frequency hopping with an automatic transition from one channel to another. If a certain frequency is disturbed this is detected by the base receiver, which then immediately switches to a redundant channel.

Tapping the system doesn't make much sense, because only monitoring messages are sent. The base receiver regularly invokes the transmitters connected to it, and asks for information about their transmitting power, the connection and some other diagnostics. All this happens within milliseconds, so the transmission period is extremely short. As a result the risk of possible interference – which is already very small, and normally only exists for older unshielded equipment – is minimized further. If needed also the temperature and pressure can be measured and transmitted, if transmitters for that purpose are added to the network.

In operation since January 2007, Hexion's wireless system has

operated without failure. "We have already received one smoke report which turned out to be a ship moored alongside the quay. Some smoke of this ship must have entered one of our warehouses – that is how sensitive the system is."

According to Punt, the rapid installation of the wireless system is a huge strong point for Honeywell. "After installing the transmitters, all we had to do was configure the system and choose optimal positions for the transmitters."

By implementing a wireless solution, Hexion avoided the costly cable lines and months of installation and maintenance not to mention approval processes to install the new system. "With Honeywell's wireless system we saved time and money and still met certain regulatory with our many diagnostic checks and gave Hexion the technology makeover and update we needed," concluded Punt.



### More Information

For more information on Honeywell's Wireless Systems or any of Honeywell's automation Products, Services, or Solutions, visit our website [www.honeywell.com/ps](http://www.honeywell.com/ps), or contact your Honeywell account manager.

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