
Wireless communication and production continuity

How quicker response cuts stoppage times and enhances Overall Equipment Effectiveness.

In any manufacturing environment, uptime is paramount. Every unplanned stoppage means lost productivity, potential delivery delays and ultimately serious cash off the bottom line. Even a small improvement in Overall Equipment Effectiveness (OEE) can translate into hundreds of thousands of euros of extra sales in the typical production environment. Wireless communication has been shown to cut unplanned stoppage times by as much as half, by ensuring the right people can respond in a timely way to implement the right solution to the right problem.

Never has the saying 'time is money' been so appropriate as in the manufacturing environment, where cutting the time lost to unscheduled stoppages translates directly into improved equipment availability and performance and product quality. These three factors are used to produce a common measure of the total effectiveness of a machine or factory, Overall Equipment Effectiveness (OEE):

$$\text{Availability (\%)} \times \text{Performance (\%)} \times \text{Quality (\%)} = \text{OEE (\%)}$$

Achieving high OEE is the holy grail of production managers around the world. But equipment failures, human error and other unforeseeable disturbances are part of manufacturing life. Increased automation and new technologies – in combination with increasingly dynamic market conditions – mean increased complexity in manufacturing systems, and increased vulnerability to disturbances and interruptions. It is not uncommon for batch processing plants to show an OEE of just 50 per cent; while an OEE of 75 per cent is not unusual in continuous processes.

The potential for improving OEE, therefore, is huge ... and it's worth improving. A study of a medium-sized automotive component manufacturer conducted at Chalmers University of Technology in Gothenburg, Sweden, found that every percentage point improvement in OEE led to an annual contribution of just under 200,000 euros to the bottom line as a result of increased productivity.

Perhaps the truest test of good production processes is how quickly and effectively unplanned stoppages are dealt with when they happen. This is where quicker response through wireless communication comes into play.

Right response for critical information ... quicker

Identifying and acting on problems early on is key to preventing small faults snowballing into major stoppages, and serious lost production. Wireless communication supports the fast, accurate execution of routines for dealing with faults and emergency situations. In this way, the time taken to identify that there is a fault and find the right resources when a problem occurs – which can be as much as 50 per cent of the typical downtime – is dramatically reduced, or eliminated.

The wireless communication solution can be integrated with plant monitoring and alarm systems so that critical alarms immediately trigger an alert to the most appropriate person. The reason for an alarm is always clear and precise. Group calling functions enable emergency response teams to open a communications channel and talk to each other at the touch of a button, if the problem needs wider attention. Wide-area mobile communications can also be integrated so that a specialist can be contacted if necessary on a mobile phone, even when off site.

It's not just during unplanned stoppages that wireless communication can contribute to a more productive, more responsive and safer production environment. Clear, unambiguous information and communication is also vital during other time-critical situations, such as planned stoppages for maintenance or machine change-overs.

Knowledge is power

By keeping everyone up-to-date and in touch wherever they go around the factory, wireless communication improves overall safety and security. Key knowledge can be transferred closer to the production equipment, so that decisions are taken faster and in a better informed way.

Wireless communication can also provide integration with monitoring and maintenance systems, so that maintenance teams can manage and perform their tasks anywhere on site. For instance, if an operator notices an unusual sound coming from a piece of equipment, he can immediately notify the appropriate engineer of the problem with its exact location, before production has to be stopped.

Armed with accurate, up-to-date information while out on the factory floor, an engineer is better able to identify faults faster and put them right in a controlled way. With wireless communication, the engineer can immediately check quality and performance data from the control room on his handset, and make any adjustments straight away. If required, adjustments or a controlled shut-down can be requested from the device, rather than after the 'emergency stop' button has been used.

With wireless communication, engineers can send back confirmations that they have completed a particular task to the control room as soon as they have finished. This enables them to move on to the next task as soon – and as safely – as possible.

Many manufacturing sites cover a large area, with relatively few people working in them. This means communication is vital in ensuring day-to-day operations run smoothly, and wireless communication helps ensure that plant engineers and operators are able to communicate with each other, and with the control room, wherever they happen to be.

Smart integration of wireless communication can make a significant contribution to quicker response to fault and failure conditions, cutting the time to rectify stoppages by as much as half. This leads directly to better availability, performance and quality – and higher profitability.

How quicker response cuts recovery time

- When an unplanned stoppage occurs, the wireless communication system immediately notifies one or more operators via their handsets.
- When an operator acknowledges the message, the others are informed of who is responsible.
- If nobody acknowledges, the call is escalated to the manager.
- The notified operator checks the cause of the stoppage and decides what measures to take.
- The operator can notify other people, if required, using a preset menu in the wireless handset.
- Action is taken.
- If necessary, the operator can control machinery direct from the wireless handset.
- If the machine is not up and running within a predefined time, an alarm is automatically sent to the manager from the wireless system.
- If someone does not answer a call at any point, the call can be escalated to another person or to an external phone (fixed or mobile).