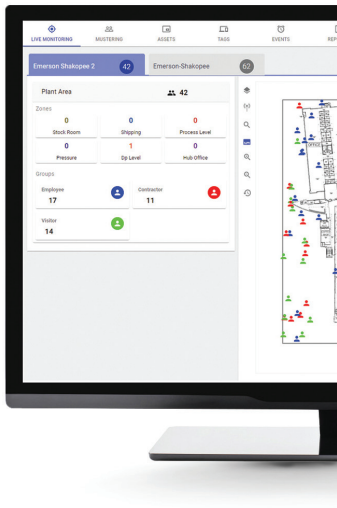

LOCATION MONITORING
FOR GREATER PLANT SAFETY

Location monitoring devices and geofencing can help reduce risks of injury or exposure for plant personnel. | By Amanda Alexander, Emerson

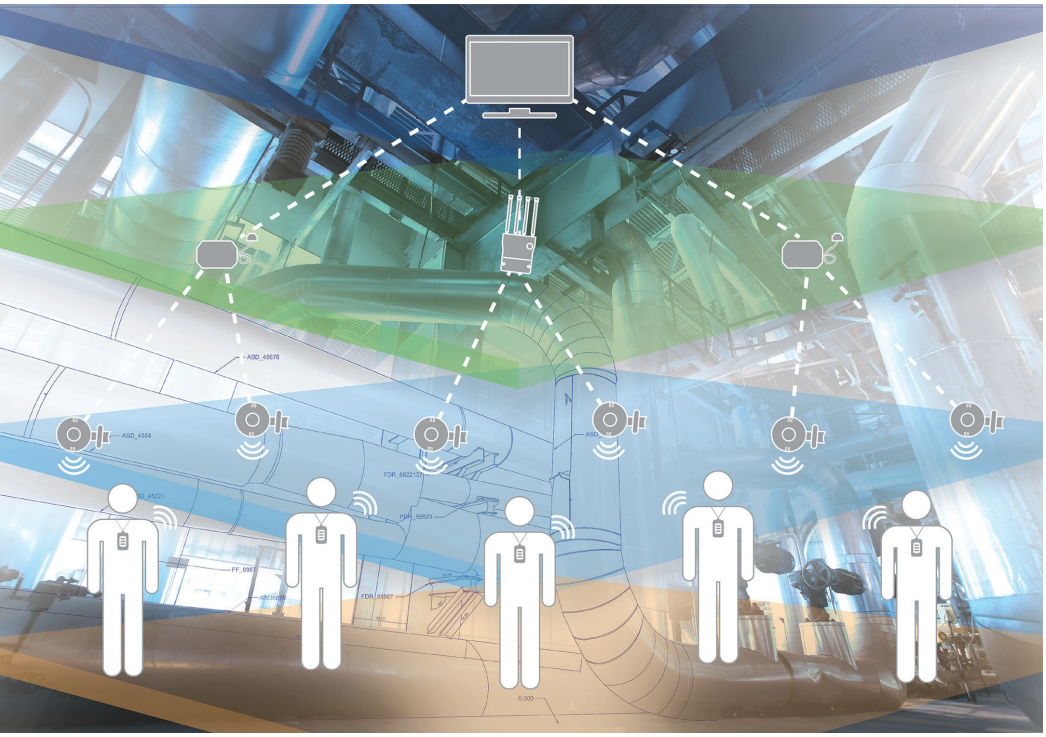

Figure 1: Location awareness architecture
Courtesy of Emerson

The COVID-19 pandemic has taught us many things, but one critical lesson is the importance of safety. Plant managers worldwide have had to put personnel safety in sharper focus and learn how to keep essential processes running without risking COVID-19 exposure for employees.

Personal protective equipment (PPE) is already used in many hazardous plant environments, but exposure to an airborne virus can happen in any area of the plant where PPE is not worn, such as the break room or the locker room. Any place where workers gather in a close group of more than two or three can be considered hazardous. Also, following the 6-foot social distancing guideline is not always possible in narrow corridors or between equipment.

The Center for Disease Control and Prevention set out guidelines to keep workers safe during the pandemic, including recommending work-from-home policies, which are not possible for critical industrial plant processes.

Should personnel contract the virus, it is vital to track their movements from before they became symptomatic, as they would have been contagious and could easily have spread the virus to others in the plant. Contagion is a danger to people and essential production processes; if too many workers are out sick, production goals will not be met.

A tech solution

Recently, a large manufacturing and technology company came up with a solution that is being tried out in several plants in different locations across the world: A location monitoring device that can be clipped to clothing or worn on a lanyard, with a chip embedded that is read from a distance by access points deployed across the facility, provides high-resolution location measurements.

Location access points are small, lightweight and battery-powered. They are low-cost compared to systems that use industrialized Wi-Fi access points, and their Class 1/Div 1, Zone 0 rating allows them to be deployed through process plant environments. Their long battery life requires very little maintenance.

The access points communicate with each other, and the *Wireless*HART gateways in a way similar to the conventional *Wireless*HART instrument transmitters used for other measurement devices. This technology makes implementing monitoring tools budget-friendly compared to other location technologies. It can be implemented in a small, high-risk portion of the plant and scaled up to cover a larger area as needed.

The accompanying software offers several useful features to deploy in the facility:

- Geofencing, which indicates when individuals have moved into areas where they should not be due to the presence of a hazard or lack of training.
- Safety mustering, which lets first responders know which people have moved to the appropriate safe areas during a drill or incident.
- Safety alerting, which allows a worker who is injured in an unsafe situation, or is a witness to an incident, to press the user-assistance button on the beacon to indicate an emergency in progress at their location.

Since COVID-19 protocols went into effect, the software has been updated to include new functions, such as monitoring social density and contact tracing.

Understanding social density

As we have seen the term used over the past year, social distancing indicates that people maintain

Figure 2: Location dashboard for geofencing

a 6-foot distance from each other to limit the airborne spread of the COVID-19 virus.

Social density piggybacks on that concept but is less about ensuring people keep the appropriate distance from others and more about how many people are in one area of a plant at any given time and what that does to risk levels of virus transmission and overall safety.

Location data and data on how much time is spent in zones can help develop scheduling patterns that reduce risks of not just virus transmission but also other potentially hazardous clustering of people during routine work or maintenance.

The technology in a plant environment

A few plants worldwide have started using this new location monitoring technology in their facilities in recent months to help them evaluate their scheduling and personnel movements throughout individual shifts and collectively as a group. Determining where personnel might cluster for either work tasks or socially in break areas or locker rooms is helping to better plan out schedules.

Here are a couple of use case examples.

1. A global chemical company with a plant in Asia-Pacific needed a location solution to support workforce safety. The company wanted to broadcast safety alerts and to automate safety mustering in case of a hazard or emergency. Implementation of the location monitoring technology included coverage of the majority of the chemical facility with specific focus on hazardous areas. The system allowed for the creation of delineated hazardous zones and multilevel location detection.

The user-assistance button feature provided an extra layer of security to personnel as a way to quickly get help in an emergency. The customer found the feature invaluable. "Even if we are able to save the life of one employee, the purpose of the technology has been achieved."

2. At a Middle Eastern facility of a global oil and gas company, the problem of location monitoring involved contractors who were widely used in one area of the facility. These contractors can only be onsite if accompanied by an employee, which caused scheduling challenges. As a solution, the facility started using location monitoring technology to automate safety mustering and add geofencing for hazardous areas and safety alerts. The facility plans to use the technology to automate their permit system with automated issuance and closure. After reviewing all the data from this implementation, they intend to deploy the system at other sites, including remote well sites.

Long-term outlook

Even after COVID-19 restrictions are lifted, the need to keep employees safe will not diminish. Companies are learning that technology is a worthwhile investment when applied where it offers the greatest benefits.

Location monitoring and geofencing help reduce risks of injury or exposure. These technologies also help companies meet important safety and compliance regulations. We anticipate that these tools will become a feature that facilities add to their digital transformation plans. It is modular and can be implemented in both small areas and across a facility, making it an adaptable safety tool. PR

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