How to Improve Safety at Your Plant

In chaotic situations, robust communication is the only thing that can improve safety and reduce injuries and fatalities.
Plant upsets are the poster children for chaos in manufacturing and process plants. Everything that can go wrong does. Operators get confused by alarm cascades and make mistakes leading to more alarms, as the situation goes further south with every passing minute.

Nothing is more chaotic than trying to find people or equipment when the operators are in the throes of a dangerous abnormal condition, or in the immediate aftermath of an accident. There may be fire, explosions, hazardous gas leaks, and any number of things that the operators and technicians need to concentrate on.

How do they know if all their personnel have been evacuated from the affected part of the plant? They often don’t. Sometimes people who could have been extracted are even more seriously injured or even killed because they couldn’t tell anyone where they were, or that they were hurt. How do they know where the nearest equipment, like maybe a fire extinguisher, is located? Often they don’t. “Where’s the forklift?” “I think it is parked behind building 6.” “No it isn’t there.” This isn’t the kind of exchange you need to have happening in your plant when alarm sirens are sounding and red lights are flashing all over the board.
Maintain Safety with Reduced Budgets

Challenging economic times plus the inherent threats of industrial environments force plants to address their drastically reduced budgets while still investing in the safety improvements for a safe working environment. Now, more than ever, every investment in safety is being scrutinized to ensure it delivers the reliability and safety it promises, reducing risk, ensuring the wellbeing of plant personnel, while continuing smooth, uninterrupted plant operations. Recent studies have shown that the high-performing manufacturers who consistently rank in the top 20% most profitable in their industries invest almost 50% more in safety systems than their industry peers who are in the bottom 30% of profitability. Plus, these low-performers were 7 times more likely to have an unplanned outage or shutdown due to a safety issue as their highly profitable peers who invested in safety. Better safety simply means better performance – regardless of the economic conditions.

Enter Wireless Technology

Wireless can reliably help you deliver the safe, efficient working environment you need for your employees and the community - while helping you get the most from your budget. Did you know that wireless safety applications are usually less than half the price of wired alternatives? In addition, wireless systems can provide a 60% or greater reduction in installation time with a similar reduction in organizational disruption. What's the bottom line? In these tough economic times, wireless safety applications mean less risk, more reward, at lower costs.

The Apprion Industrial Safety Solution includes the ION System and ION Applications to provide an integrated industrial safety solution. With an industrial network appliance and integrated dashboard plus advanced wireless applications, the Apprion Industrial Safety Solution provides personnel and hazardous material tracking, controlled access to restricted areas, improved emergency response time, perimeter monitoring and protection, emissions monitoring, effective communications, remote monitoring and many other critical safety functions to ensure that your facility is operating at the highest safety level.

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ION Applications for Industrial Safety

Apprion's ION Applications for Improved Safety Include:

- **ION Communications** - Includes several plant-wide communication applications that are critical to plant safety such as alarms and alerts for emergencies, start and dismissal, broadcasting messages and process control signaling.
- **ION Personnel Tracking** - Provides real-time notification when personnel’s safety is in jeopardy. With wireless Personnel Monitoring applications, management and control officials are notified immediately via RFID and GPS as to the specific location and status of potentially injured person. Wireless video cameras and badges activate immediate alerts when uncertified personnel enter restricted areas.
- **ION Mustering** - Verify safe location and status of all personnel during an emergency. Save time and execute efficient emergency response process for locating all personnel.
- **ION Safety Shower and Eye Wash Monitoring** - Wirelessly monitor blocks of safety showers and eye wash stations. Immediately locate and help injured person when the wireless sensor at the station transmits the notification to the manager’s mobile device or to the control room.
• **ION Emissions Monitoring** - Remotely monitor all tanks and containers for emissions and condition levels. With remote wireless, there is no need to send personnel into dangerous areas to gather emission data, thus improving worker safety and freeing up personnel for other critical tasks.

• **ION Hazardous Material Tracking** - Instantly find a container’s location via IONosphere’s dashboard and regional map functionality. Use photos and drawings of your plant to easily locate specific HAZMAT containers immediately and view real-time status information on temperature, pressure, maintenance, schedules, and other condition status.

• **ION Video** - Remote wireless cameras and centralized monitoring equips plants with a secure, reliable, low-cost way to significantly increase productivity, safely monitor hazardous, remote locations and satisfy regulatory mandates.

**IT’S ABOUT COMMUNICATIONS**

The first, second and third rules of personnel safety, security and efficiency are all the same – effective communications. There is nothing more essential to the safety of personnel and the surrounding community of industrial facilities than a highly reliable emergency notification system that alerts employees to serious events, severe weather, fires, gas leaks and other incidents. Apprion designed the ION Emergency Notification Application to address these specific safety issues at industrial facilities.

Apprion’s ION Emergency Notification Application provides plant-wide notification and effective, reliable, rapid communication via alarms and voice information directing personnel to take appropriate action and faster incident response. Plus, the ION Emergency Notification Application is a wireless, cost-effective means to easily comply with safety and security mandates. If your communication systems have fallen out of compliance, are no longer reliable or have aged beyond the point of reasonable repair, your employees and facility are at risk.
ION Emergency Notification

Includes:
• Omni-directional speaker arrays
• Directional speaker arrays in appropriate areas
• Wireless Strobes
• Integration with AM Broadcast system to broadcast pre-recorded emergency information over a radio accessible by contractor vehicles
• Basic integration with PBX systems
• ION-based interface for alarm activation of pre-recorded alarms, warnings, and voice information
• Audit trail reporting of incidents and history

Effective Communications Will Save Lives
Without a doubt your employees and contractors are the most important assets at your facility. Their safety is paramount. A pervasive, effective communication approach in an emergency gets the word out and keeps personnel and assets safe. ION Emergency Notification accomplishes this by quickly and reliably notifying personnel and the surrounding community of serious incidents with audio alerts, visual strobes and verbal instructions with the appropriate action to be taken. The end result is better emergency management and resource deployment, shelter-in-place or evacuation guidance, organized coordination with internal and external teams and resources, and status updates throughout the duration of an incident.

Loss Prevention
Regulatory agencies require that industrial facilities must adequately notify all employees of hazardous incidents. The main loss prevention measure facilities can take to avoid fines and lawsuits is implementing a communications system with several layers of notification for personnel safety such as the ION Emergency Notification Application.

• In the last 24 months, OSHA has quintupled the number of Compliance Inspectors with a specific focus on the chemical, refining, power and steel industries. The pressure is on to comply.
• Insurance and underwriting costs are reduced when efficient notification systems are employed and maintained. Comply and your insurance rates will be lower than plants that do not.
• Personal injury and workman’s comp law suits are far less likely to be filed against a company with an effective and reliable employee alerting system.
• Sustain critical communications internally and externally over prolonged periods of time to resolve and recover from incidences expeditiously. This results in minimal downtime and minimal revenue loss.
Cost-Effective Compliance
Satisfy compliance and reporting requirements through ION Emergency Notification’s automated alerts, real-time confirmations, and extensive audit trail reporting. ION Emergency Notification addresses Occupational Safety and Health (OSHA) compliance requirements as well as safety and security regulations such as the Chemical Facility Anti-Terrorism (CFAT) standards, U.S. Coast Guard Maritime Security (MARSEC) levels and the North American Electric Reliability Corporation Critical Infrastructure Protection (NERC CIP) standards.

Effective Communications
Promotes A Good Corporate Citizen
ION Emergency Notification promotes good communication and corporate citizenship. Not only does the investment in a reliable, effective communication system pay dividends in lower insurance rates and less scrutiny from industry regulation agencies, but more importantly it indicates that your facility values the lives of your employees, contractors and visitors. This will help foster stronger collaboration within and outside your organization.

Collaboration and Musterling
In the harsh environments of industrial processing facilities, complex requirements and activities can lead to chaotic and even dangerous situations. There is a pressing need for a centralized information platform with clear, up-to-the-second communications about the status and safety of personnel and equipment.

ION Collaboration is a real-time communications system that allows work teams to communicate collaboratively with message streams filtered according to topic, and avoiding unnecessary distractions. This adaption of consumer-oriented social networking systems allows plant, field or control room personnel to post critical messages on a topic specific message stream (like a filtered Twitter feed) so that all members of a team are up to date on events and activities related to a particular process.

Each activity feed has its own secure stream, and user groups are established so that only members of that group have access to a specific wall or information stream. Mobile users can view and contribute to the stream with mobile devices such as smartphones or tablets.

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Activity Feeds in the ION Collaboration Application Dashboard

Tailoring communications so that everyone can contribute and receive strictly relevant and actionable messages—in real-time—vastly improves communication within and around an industrial facility. This leads to both enhanced productivity and safety.

ION Mustering provides wireless technology and the integrated ION dashboard to verify the location and status of all personnel during an emergency. The solution leverages real-time personnel tracking via WiFi, GPS or RFID tags, and visual confirmation of the safety of every individual within a facility. This provides a much faster, accurate and more efficient system than traditional manual processes for locating personnel. When an alarm is activated, safety wardens can immediately which personnel are already in the mustering area, and who might be missing. Personnel icons on regional maps show specific location as well as a visible trail of recent movement. Combining location and movement tracking can provide effective indication of “man down” status. When ION Mustering is combined with ION Video, safety wardens have access to a visual check on mustering areas to identify personnel and view live status. ION Emergency Notification activates an audible alarm for hazardous situations and evacuation and field personnel can communicate their status in a live activity feed via ION Collaboration from the smartphone or tablet they are carrying in the plant.
Real-Time Wireless Safety Shower Monitoring

Often in large, industrial facilities with multiple safety showers, finding the triggered shower and getting help there in time can be a daunting task. Wired solutions try to provide support for safety shower and eye-wash stations, but often the injured employee cannot move once the safety shower or eye-wash is triggered or no one is monitoring the triggered safety equipment at the critical time. Plus, wired monitoring means running wires to the switches in the field – lots of wires and switches through treacherous areas escalates the implementation costs to sometimes as much as $4,000 per point. With wireless, the cost of running the field wiring is completely eliminated, providing a 75% cost-savings using wireless sensors compared to hardwire.

The ION Safety Shower Application provides real-time alerts notifying managers when the safety shower or eye wash is activated. In the same area of the ION dashboard you can view the specific activated shower and the exact location on a regional map. In addition, ION Safety Shower offers automated record-keeping for safety audits, and improved Environmental Health & Safety standards, plus time-stamping and trending reports for compliance reporting. The ION Safety Shower is part of the integrated ION System which includes applications for Location, Communications, System Monitoring, Video and Mobility. As a result, ION Safety Shower can be easily combined in a single dashboard with other applications such as Video, Emergency Notification and Mustering to provide managers with real-time safety shower and eye wash alerts, concurrent video monitoring and emergency communications for a comprehensive safety solution. The end result is a cost-effective, real-time solution that greatly increases the safety of all field personnel, dramatically improves the outcome of emergency situations, and enhances employee peace of mind.

The ION Mustering Application Dashboard: Integrated with ION Video
Wireless Real-Time Emissions Monitoring
With ever-increasing pressure, environmental regulators are forcing manufacturers to examine cost-effectively ways to gather and record accurate measurements of their environmental emissions. New regulations require process manufacturers to monitor emissions to meet local, state, and federal requirements to ensure they operate within directives, and to provide immediate notification when certain emissions occur.

Early emissions compliance approaches are often complicated, and prone to error, relying heavily on operators transcribing manually collected data input into spreadsheets. Such approaches lack the accuracy, timeliness, and consistency demanded by today’s regulations.

The ION Emissions Monitoring Solution integrates cost-effective wireless sensor networks with the ION Condition Monitoring application to provide an integrated dashboard and reporting engine that greatly simplifies all of your monitoring, management, and verification of any facility’s environmental emissions.

- ION Emissions Monitoring provides:
  - Lower installation and maintenance costs
  - Real-time notification/alerting of compliance events
  - Higher reliability
  - Lower safety risks
  - Faster deployment, quicker compliance
  - A shared wireless infrastructure that can be extended to support other wireless applications

Wireless Real-Time Hazardous Material Tracking
Handling of hazardous materials requires companies to accept significant responsibilities, implement specialized and additional processes, and consequently incur substantial costs to track and secure the materials. Threats and dangers can include product tampering, or contamination, spills, and explosions any of which can result in environmental damage, personnel injury, and even fatalities.

The ION Hazardous Material Tracking Solution provides complete asset visibility for all hazardous containers as they move throughout a facility or between facilities. Location tags using wireless technology track HazMat containers and provide real-time status information on temperature, pressure, maintenance, schedule, hatch monitoring, and other condition status reports.

The ION Hazardous Material Tracking Solution enables:
- Views on all HazMat containers exposing regulatory compliance status
- Use photos and drawings of a facility to easily locate specific HazMat containers immediately
- Maintain scheduled maintenance
- Easily add new wireless applications under a single infrastructure

Wireless Video Monitoring
Remote video monitoring can help address the challenges of increasingly complex regulations, an aging workforce that will diminish the pool of skilled workers and the inherent problems of most processing facilities for plant safety, security and operations by providing visibility into hazardous and unmanned areas such as wellheads and substations, while extending the capabilities of your limited workforce.

The large physical area and inherent hazards of most processing facilities introduce many challenges including increasingly complex regulations, aging workforces that will diminish the pool of skilled workers, and the inherent problems of most processing facilities for plant safety, security and operations. Remote video monitoring can help address these challenges and provide visibility into hazardous, remote and unmanned locations while extending the capabilities of your limited workforce.
The ION Video Application analyzes motion, tracks, counts, and identifies objects and delivers video intelligence from live video streams. ION Video performs video analysis, issues real-time alerts to appropriate security, safety, and operational personnel, and archives video for intelligent search, event correlation, and performance auditing. With the ION Wireless Video Application, plants are equipped with an intelligent secure, reliable, low-cost way to significantly increase productivity, safely monitor those hazardous, remote locations and satisfy regulatory mandates.

Key ION Video Application Feature include:

- Integrated view and links of all facility cameras
- Monitor the status and network activity of any IP-enabled camera
- Optimized Archiving and event analysis
- Intelligent Search on key visual attributes captured in the video
- Carousel Monitoring from multiple cameras in an integrated dashboard
- Video triggered alerts and alarms notify operators of specific plant events
- Remotely monitor and diagnose operations through the central IONosphere console
- Pan, tilt and zoom of camera remotely through IONosphere console
- Asset Detector to continuously monitor a scene, detect and alert when any valuable property is removed
- Object Left Detector to continuously monitor an area and detect objects that have been left unattended
- Video Enhancer to process and enhance the quality of an input video stream for better viewing

Integration for Comprehensive Safety

Apprion’s ION system is an integrated holistic approach to safety monitoring including applications for location, communications, system monitoring, video and mobility. All these applications are combined into a single dashboard to provide a cost effective, real-time comprehensive safety solution. This greatly increases the safety of all field personnel, dramatically improves the outcome of emergency situations and enhances employee peace of mind. For more information contact Apprion: www.apprion.com.