Safety professionals can use the data to gain an unprecedented understanding of the factors that are paramount to their jobs, such as worker behaviors, machinery compliance, shutdown or stoppage causes, and safety anomalies and trends. More importantly, they can use the data to significantly improve safety compliance and performance in their organization.

Use Cases: Safety in the Connected Enterprise

Safety professionals can improve how they approach safety by using safety-system data and the greater connectivity available within a connected enterprise.

Better Understand Safety Risks

Risk assessment data is rarely used outside the machine-design stage. But in a connected enterprise, it can take on a new role in the form of a safety calculator. It is a novel yet simple tool that safety professionals can use to measure anticipated risk against actual risk for each machine access point. First, the calculator can be easily configured as a basic table within an enterprise manufacturing intelligence software. Then, a safety professional can simply enter a risk assessment’s anticipated use-frequency data as the baseline for safety performance and compare it against the machine’s actual use-frequency data. This can be done for individual safety functions such as operator access points and gates, quality checkpoints and emergency stop devices.

Lower-than-expected use frequency could indicate that a safeguard is being defeated and needs to be reevaluated. Higher-than-expected use frequency could indicate that a product or process change should be addressed. Any usage outside of the expected frequency or duration could represent a compliance issue or, conversely, an opportunity for process improvement benefitting production.

Enhance Safety Performance

Safety professionals can use real-time data and connectivity to improve safety performance in many ways. For example, employees who work with hazardous materials or in harsh conditions can use real-time data to monitor and track potentially dangerous environmental conditions or manufacturing process states. The ability to deliver information to workers in more convenient ways using mobile or wireless technology can help improve ergonomics or reduce the strains on an aging workforce.

Remote monitoring of isolated or dispersed operations also can help reduce the need for workers to travel between sites, such as to check on wellheads, pump stations and storage sites in the oil and gas industry. This can reduce the risk of transportation incidents, a top cause of fatal work injuries in the U.S. (BLS, 2015).

In some instances, network connectivity could be a company’s last or only link to employees. Wearable sensors, for example, could be used to locate workers during emergencies in underground mines or other hard-to-reach places. Voice, video and display technologies also could help companies monitor and communicate with workers following a safety incident.

Monitor Worker Behaviors

Safety system data can help identify discrepancies between how policies and procedures are defined, and how workers actually carry them out. It can similarly identify discrepancies between how safety technologies are designed and how workers actually use them.

Workers may be misusing E-stops, for example, to clear jams or stop production at the end of a cycle. This mistake can lead to increased scrap and longer machine startup times, resulting in loss of production.

In a connected enterprise, safety professionals can collect an E-stop
activation’s time stamp and downtime duration, as well as the line and shift associated with each activation. They also can create stoppage reason codes to identify why a machine was stopped, such as for jams, misfeeds or cleaning.

Safety professionals can then analyze this data in existing metrics and alarms-and-events software to determine whether E-stops are being used at an abnormally high rate. Or, they may discover that higher activation rates are associated with specific production lines or shifts. Safety professionals can then use these findings to take whatever corrective action is needed, whether it is providing additional training, revising standard operating procedures or updating a machine design. This information may also point to potential improvements in procedures or processes, resulting in a best practice that could be adopted as a standard operating procedure.

Ease Compliance
Manually auditing safety data for compliance and reporting purposes can be a time consuming process and subject to human error. Companies can speed up the auditing process by integrating auditing functions into the operator interface and controller. In addition to saving time, this can free up personnel for other priorities and reduce the likelihood of manual data-collection errors.

Because detected abnormalities can be annunciated in operator interface dashboards or reports, automated auditing can also help workers more quickly identify and address potential issues in their plants. This is because the information is regularly monitored and pulled, making for faster and improved decision making.

Rethinking Industrial Safety
In a connected enterprise, companies can do more than improve how they monitor and manage safety; they can create innately safer operations that better complement production.

Oil and gas companies, for example, can now use Ethernet-connected unmanned subsea platforms in place of manned topside platforms. This changes the industrial safety equation in offshore production because workers on topside platforms face serious inherent risks, such as ship collisions and explosions. In the mining industry, autonomous trucks and trains, which can be monitored and controlled from a central location, are also helping to reduce transportation-related safety risks.

The emergence of connected, information-enabled industrial safety is a watershed moment for industrial companies, whether the approach is small, incremental improvements or dramatic transformation. The ability to access, analyze and act on safety-system data in a connected enterprise can help safety professionals rethink how safety is realized and set more aggressive improvement goals, much like what many of their counterparts on the production side are already doing today.

References

A white paper on the same topic is available on the Rockwell Automation website, at http://bit.ly/2moN88F.