



**SAFETY COMPLIANCE  
AND CHANGING  
INDUSTRY PRACTICES**

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Regulatory compliance in the process industry is in flux owing to fragmented processes and growth in business. What follows is an array of challenges. Process industries worldwide are beleaguered with issues such as skill gap, regulatory compliance and most importantly, an increase in workplace safety costs. The latter is directly connected to the rising rate of accidents and injuries at the workplace, ineffectual risk analysis, and inefficient forecasting. Conventional methods adopted by process industries to ensure safety management and identification of potential hazards, such as Hazard and Operability Study (HAZOP), have now become tools to achieve compliance.

On the brighter side, these challenges can be addressed by leveraging the very engineering and design expertise that the industry applies in manufacturing. Taking cognizance of this fact, the need of the hour is to embrace a new model of process safety management, one that breaks down the problem into its constituent components and addresses each comprehensively and synergistically to cover all bases. In tandem, it is necessary to also leverage the power of digital technology towards delivering complete and well-rounded safety solutions for instilling greater trust in workers through improved working conditions.

## ADOPTING A STRATEGIC APPROACH FOR HOLISTIC SAFETY SOLUTIONS

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On the factory floor, a few critical safety concerns relate to manual installation, operation or servicing of machinery, and electrical safety. To design workflows and protocols that minimize worker injuries and incidents during such interactions, the first step is to carry out detailed inspection for analysis of existing workflows, assessing the degree of risk, and identifying areas of concern.

Insights derived through this process then form the conceptualization of specific and targeted interventions that can address these lacunae. The solution is first articulated in virtual form and then refined through an iterative process. This constitutes the first and most critical phase of machine risk assessment and solution development.

In the next phase, chosen designs are prototyped and mounted on 3D replicas of the machinery for testing and further fine-tuning. Then follows fabrication, assembly and installation of safety guarding systems, with every step being subjected to careful supervision in accordance with safety guidelines.

A similar process must be followed in the case of electrical safety, beginning with thorough inspection, identification of risk areas, and development of detailed plans for managing or mitigating this risk. Relevant evaluations include load flow studies, short circuit studies, relay coordination studies and ground grid studies, among others. Based on these findings, it becomes possible to modify settings on devices that will help ensure equipment protection, minimize arc flash, and reduce system disruption. Another outcome takes the form of optimized sequences of operation for protective devices.

In all instances, it is essential to enlist the services of Certified Machinery Safety Experts or Electrical Safety Experts, as these individuals are familiar with industry standards and legislation with regard to machine safety.

## REDUCING INCIDENTS THROUGH DATA ANALYTICS

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According to the International Labour Organization, more than 600 work-related accidents take place every minute! Concerned over the rising rate of such incidents, even organizations that started off with a brick-and-mortar presence are now digitalizing their factory floor operations to adapt and ensure safety.

The latest industrial trends are heading towards Industry 4.0. Supply chains are benefitting from increased intelligence through the connectivity of machinery on the factory floor which allows for real-time supervision and predictive alerts. The very same mechanisms can also be actively leveraged to mitigate safety risks and boost productivity.

With insights delivered at each level by Advanced Data Analytics, accidents are being averted through automated alerts, statistical analysis, forecasting and extrapolation. Such predictive analytics can deliver big benefits – take for instance a subsidiary of a major manufacturing company that brought down the number of safety incidents by more than three quarters!

Workplace safety and equipment monitoring go hand-in-hand. Several industries are also relying on digital visualization to effectively monitor remote areas that were otherwise difficult to access. In this way, the Industrial Internet of Things (IIoT) has also found its use in the predictive maintenance of equipment to avert accidents, besides enabling industries to deliver better products and services than ever before.

This development is particularly valuable for industries where workers are routinely exposed to hazardous working environments. The payoff that is likely to emerge, in terms of improved health and safety, productivity, efficiency, output quality, revenue and market share, compensates greatly for the initial investment necessary to deploy IIoT-based safety management.

## THE DISRUPTIVE FORCE IS SLOWLY ENTERING PPE

Wearables have revolutionized the entire concept of Personal Protective Equipment (PPE), and are no longer limited to safety elements or gloves. With the addition of sensors to existing manufacturing infrastructure, information is harvested, transmitted and analyzed to predict risks and avert them in time. Cloud connectivity increases the speed and efficiency of data-sharing with stakeholders; in this case, the workers themselves.

Along these lines, LTTs has installed radio chips in workers' helmets and sensors on their equipment, to be able to ensure constant vigilance and prevent health issues and tragic situations, which can in turn translate into long-term cost-savings and enhanced compliance.

Other new technologies such as Augmented Reality and Virtual Reality enable inspections to be carried out more efficiently. By simulating expected conditions, diagnosing problems, and finally assigning them to safety maintenance groups, these breakthrough technologies equip inspectors with valuable visual-based tools.

Forecasts indicate that digitized plants are the future of manufacturing, enabling machines to connect and collaborate with one another to work faster and more efficiently. At the same time, digital technology, when integrated with machine safety and electrical safety protocols and solutions, opens up new avenues for process safety management.

## TRANSFORMING THE FUTURE OF THE PROCESS INDUSTRY

Strategic design thinking enables an all-round holistic approach to the complex and pressing problem of worker safety. Putting in place streamlined protocols for addressing machine safety and electrical safety on a regular basis goes a long way towards significantly reducing instances of injuries, occupational exposure and casualties.

Further, embracing digital technologies allows manufacturers to transcend the bare bones requirements of regulatory compliance and actively create policies to ensure uncompromising commitment towards the safety and well-being of their workers. This system can be rounded out with employee insurance and first-aid services. With the implementation of such policies, manufacturers can look forward to deepening an ethos of trust between themselves and their workforce, guaranteeing enhanced performance, productivity and output.

However, the benefits don't end there. Effectively integrating smart technologies into manufacturing lays the foundation for the process industry to enter the digital future with greater confidence in its ability to integrate a wider range of emerging technologies to cater to more varied demands. This will further bolster the spirit of innovation and help create a broader, more diversified range of offerings to deliver better all-round value to clients.



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