Safety Maturity: Three Crucial Elements of Best-in-Class Safety

By Steve Ludwig, Safety Programs Manager, Rockwell Automation
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Find out how your company measures up when it comes to safety

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Executive Summary

Every 15 seconds, somewhere in the world, a worker dies from a work-related accident or disease, and 160 workers have a work-related accident. Every day, 6,300 people die as a result of occupational accidents or work-related diseases – more than 2.3 million deaths per year. The economic burden of poor occupational safety and health practices is estimated at 4 percent of global Gross Domestic Product each year.1

The benefits of optimizing safety extend far beyond fewer injuries or fines. Companies that approach safety holistically can improve productivity, gain efficiencies and experience improved employee morale – while also protecting their brand reputation.

Today, best-in-class manufacturers realize that the combination of employee behavior, processes and procedures, and technology implementation enable them to achieve 5-7% higher OEE, 2-4% less unscheduled downtime and less than half the injury rate of average performers. These best-in-class manufacturers share common best practices surrounding three core issues - Culture (behavior), Compliance (procedural), and Capital (technical).

To support this holistic, comprehensive view of safety, Rockwell Automation has introduced the Safety Maturity Index™ 2 (SMI). The SMI is a comprehensive measurement of performance in safety culture, compliance processes and procedures, and capital investments in safety technologies. It helps companies understand their current level of performance and steps they can take to improve safety and profitability.

Culture - Safety culture represents company and worker behavior. Safety culture is generally indicative of the broader company culture. Employees who are transparent, accountable and seeking to continually improve with respect to safety will carry those traits into the rest of their work, to the company’s benefit – helping improve employee morale and help attract top-quality workers, which will feed into the company's strong culture.

Compliance - Safety compliance represents company procedures. Environmental, Health & Safety (EH&S) and Engineering Departments must collaborate on Culture (EH&S), Compliance (both EH&S and Engineering) and Capital (Engineering). At a minimum, a company should have functional safety standards in place that have been agreed upon by engineering, EH&S, operations and maintenance. Companies must also enforce safe practices from suppliers, since preventable industrial accidents and mistreated laborers increasingly result in supply chain interruptions and represent substantial reputational risk to your brand.

Capital - Safety capital represents company technology, vital to both safety and productivity. Studies show that 74% of best-in-class manufacturers use integrated safety technologies to improve diagnostics and reduce unscheduled downtime. Integrated solutions can be connected to plantwide information systems, giving plant operators visibility into metrics such as downtime reports, and machinery and line efficiency.

The Safety Maturity Index - The SMI gives manufacturers visibility into their safety programs and the ability to optimize them. It can help an organization measure and evaluate its safety program against the three key pillars – culture, compliance and capital – on a scale of one to four.

For SMI 4 level manufacturers, safety is considered vital to the health of the business and its employees. Compliance processes are clearly defined, and even suppliers must live up to required safety standards. The company conducts thorough risk assessments, follows the Functional Safety Life Cycle, and uses advanced safety technologies to improve worker safety and OEE.

To access the SMI, visit http://www.rockwellautomation.com/go/smiwp

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Every 15 seconds, somewhere in the world, 160 workers have a work-related accident. Every 15 seconds, somewhere in the world, a worker dies from a work-related accident or disease.

As a result of occupational accidents or work-related diseases, 6,300 people die every day – that’s more than 2.3 million deaths per year. Annually, 317 million accidents occur on the job – many of these resulting in extended absences from work.

The human cost of this daily adversity is vast, and the economic burden of poor occupational safety and health practices is estimated at 4 percent of global Gross Domestic Product each year.¹

Worker safety is a fundamental human need and requirement in manufacturing and industrial settings. It protects workers, prevents unnecessary downtime and satisfies standards compliance. In addition, best-in-class companies regard safety as a core value and productivity driver, not a burden.

Plant-floor safety has long been viewed as an onerous and costly obligation that adds little value to overall operations. In many companies, safety has been viewed as a productivity drain. Today, best-in-class manufacturers realize that the combination of employee behavior, processes and procedures, and technology implementation enable them to go far beyond simple compliance to deliver improved productivity and greater efficiencies, and dramatically lower injury rates.

Recent research shows that best-in-class manufacturers that address safety in three key areas – culture (behavioral), compliance (procedural) and capital (technical) – have fewer safety incidents and significantly improved operational performance. This paper examines the three critical pillars (the three “C”s) of safety and how they contribute, not only to worker safety, but also to greater overall plant performance.

Rockwell Automation has introduced the Safety Maturity Index™ (SMI) self-guided assessment tool – drawn from studies, extensive private research, collaboration with cultural development experts, input from leading manufacturers and a wealth of experience as the world’s leading provider of safety systems. The SMI tool is a comprehensive measurement of performance in safety culture, compliance processes and procedures, and capital investments in safety technologies. It helps companies understand their current level of performance and steps they can take to improve safety and profitability.
Introduction

Every manufacturer’s approach to safety is unique and dependent on factors ranging from vertical market, company size and operations, potential hazards and regional safety standards. But looking beyond the makeup of a company’s safety programs and examining the larger trends of the best performers can provide valuable insights into what can be accomplished when safety is implemented holistically, with consideration to a manufacturer’s larger operations.

The Aberdeen Group, in three separate surveys, showed that manufacturing executives used four key performance indicators to measure safety performance:

- Overall equipment effectiveness (OEE)
- Repeat accident rate
- Injury frequency rate
- Unscheduled asset downtime

The survey found that best-in-class manufacturers, defined as the top 20 percent of aggregate performance scorers, achieve 5 to 7 percent higher OEE, 2 to 4 percent less unscheduled downtime and less than half the injury rate of average performers. These higher-performing companies also experienced far fewer workplace accidents compared to average performers – 1 in 2,000 employees versus 1 in 11 employees.

Best-in-class manufacturers share a common set of best practices that can be grouped into three core elements of any safety program:

1. Culture (behavioral)
2. Compliance (procedural)
3. Capital (technical)

Each of these safety pillars is equally critical and dependent on the other. A company that builds a strong safety culture, for example, can only go so far without complying with standards and investing in safeguarding technologies. Likewise, manufacturers can make significant investments in safety technologies and procedures, but those investments only go so far if management doesn’t embed safety into the cultural DNA of the company.

As an additional challenge, the knowledge necessary to improve each of the safety pillars often resides in disparate functional areas. For example, while Environmental, Health & Safety (EH&S) groups likely implement safety policies and procedures, they most often do not include documentation around safeguarding on new machinery coming into the plant. Engineers are focused on designing machinery safety systems, but they may not consider involving EH&S, and sometimes are unable to secure funding for compliant safeguarding systems and controls. Communicating and collaborating across functional groups is essential for a comprehensive approach to safety.

1. Culture

A safety culture is generally indicative of the broader company culture. Safety culture represents worker and company behavior.

A major food manufacturer recently worked with Bright Side Inc., an Ohio-based behavioral strategy firm that works with dozens of organizations on building safety into the culture. One of the manufacturer’s plants had received a corporate certification for superior discipline, and best work processes and practices. However, after a safety assessment, it was revealed that workers weren’t actually reporting all safety incidents because they were concerned it could jeopardize the plant’s hard-earned certification.
While the safety work processes were strong, there were major variations among workers in how they performed those processes.

To address this, Bright Side and the manufacturer addressed three strategic employee behaviors:

• **Transparency** – Establishing a climate of trust in which employees could speak the truth without hesitation and understand safety is more important than productivity

• **Shared Leadership and Accountability** – Engaging employees to be responsible and accountable, not only for their own personal safety but also for others

• **Business, Self-Rationalization** – Changing employees’ approach to safety, from robotically following processes to engaging their brains when making safety-related decisions

“Employees who aren’t honest about safety won’t likely feel obligated to be honest about other things, which can lead to a culture of mistrust and dishonesty,” said Donna Rae Smith, founder and CEO of Bright Side. “Likewise, if workers feel encouraged to disregard ‘official’ safety policies and procedures to reduce maintenance time or increase throughput, they’ll likely feel just as flexible about other company policies and procedures. They may also believe that the company is more interested in profits than employee well-being.”

On the other hand, employees who are transparent, accountable and seeking to continually improve with respect to safety will carry those traits into the rest of their work, to the company’s benefit. Moreover, employees internalize safe behavior, taking responsibility for not only their own safety, but also that of their coworkers. Committed employees will accept and appreciate feedback from colleagues who they know will help improve their safety.

In addition to helping boost safety – which can in turn improve productivity – a strong safety culture can improve employee morale and help attract top-quality workers, which will organically feed into the company’s strong culture.

One of the biggest hurdles to overcome in achieving a strong safety culture is creating a shared and common appreciation for safety among all parties – from top floor to shop floor. Most manufacturers will say safety is a priority. But attitudes and behaviors on the plant floor too often prove such statements to be little more than superficial lip service because “priorities” often change with each moment.

If safety is considered simply a priority within a company, it has some competition – other company priorities. For best-in-class manufacturers, safety is more than a priority – it’s a core value. When safety is ingrained as a value within a company’s culture, neither management nor employees on the plant floor will make exceptions to safety, no matter how big the customer or how urgent an order.

Some preliminary questions to help gauge a manufacturer’s safety culture include:

• Are leaders, teams and employees objective observers?

• Can employees see what’s happening on the plant floor and understand the real or potential impacts on safety?

• Are safety problems met with excuses or finger-pointing?

• In meetings or on the plant floor, does everyone speak up or is it frequently the same people?

• Are safety issues treated honestly and transparently?
A strong safety culture is communicated and demonstrated from the top down. Every employee should know that management is fully on board with a world-class safety culture, and safety should even be integrated into a company’s brand and business plans.

PepsiCo provides a strong example of a safety culture in action with the implementation of its Global Environmental, Health and Safety Management System (GEHSMS). The system conforms to ISO 14001 but also sets “global standards for risk areas” across the company.

The PepsiCo environmental, health and safety (EH&S) policy, implemented under the GEHSMS, includes a proactive “ownership culture” across individual, managerial and organizational levels. The policy, distributed from the CEO and sent across the company’s brands, states, “We believe that environmental incidents and occupational injuries and illnesses are preventable, and we aspire to be an incident-free workplace.”

Striving for continuous improvement is an integral characteristic for best-in-class performers. After all, manufacturers can’t become the best if they’re not continually seeking to become better.

2. Compliance

A significant challenge for manufacturers is determining how to bridge the disconnect between engineering and EH&S. Often times, the larger the company, the larger the gulf is between these two groups.

Communication is the key to closing the gap between engineering and EH&S. Both groups need to collaborate and work toward a common goal, but may not have a solid understanding of the other’s job or function. Communicating, holding meetings and understanding how each person’s job affects the other’s will allow these teams to work toward a shared goal rather than the personal outcomes of each group. In some best-in-class organizations, engineering and EH&S are organized as part of the same department, and EH&S is an established career path for engineers.

Cross-functional communication is also critical when ordering new machinery. At a minimum, a company should have functional safety standards in place that have been agreed upon by engineering, EH&S, operations and maintenance. This will help ensure there is consistency among the plant’s machinery and also help incorporate the needs of workers who will be involved with the equipment.

For example, a bolt-on safeguard may be fixed over a hazardous spinning blade on a new machine. But if an operator needs to clean the blade on a daily basis, he or she may find a workaround — such as permanently removing the guard or reducing guard fasteners. Now, workers are exposed to the hazard, and the investment made in safety has been wasted.

“Performing a proper task-based risk assessment and considering all human elements that will be involved with the machine is critical,” said Mike Miller, FS TÜV Expert, global safety market development at Rockwell Automation. “Studies show that about 90 percent of machinery safety incidents occur outside of normal operation.”
Manufacturers should apply the same standards to equipment upgrades as they do new-equipment purchases. This is particularly important for companies with in-house engineering capabilities. Design and remanufacturing projects originating from these in-house departments too often are not held to the same standards as OEM-delivered new machinery. If anything, however, in-house engineers should be extremely familiar with their own company’s standards and be held to an even higher standard than OEMs.

In addition, manufacturers need to consider the impact of compliance (or lack thereof) beyond their own walls. The companies that turn a blind eye to vendors or material suppliers with lower standards risk intense public scrutiny for dealing with such businesses. Consider the backlash against major Western retailers following the 2013 factory collapse in Bangladesh that killed more than 1,000 people and injured thousands more, or the controversy associated with the working conditions of employees for Asia-based contractors that support major consumer electronics companies.

Companies face major financial and reputational risks if their operations are interrupted by, or even associated with, supplier negligence in a multitude of areas. Supply-chain safety is one such area gaining attention, as safety violations, preventable industrial accidents and mistreated laborers can result in costly fines, company downtime and negative news coverage that can impact profitability.

Best-in-class manufacturers understand this risk and put the same requirements on third parties as they put on themselves. And, more often than not, the larger the company, the more influence they can have on their suppliers.
3. Capital

It’s important for manufacturers to have a solid understanding of their safety technologies and techniques. Companies can do this by determining which of the following categories they best fit into.

- **Incomplete or Improper**: Safety is an afterthought if it is considered at all. Workers are expected to keep themselves safe. If safety technologies are used, they are likely misused, defeated, or non-safety technologies are used in place of safety technologies.

- **Basic**: Efforts are made to ensure the plant is compliant with safety regulations. In place of standard control devices, basic safety technologies and techniques are used, including safety relays and lock-out/tag-out procedures.

- **Optimized**: Supplemental safety technologies and techniques are used to optimize safety. In particular, manufacturers use alternatives to lock-out/tag-out tasks when they are deemed to be cumbersome, costly or time consuming.

- **Integrated**: Machinery has tight integration between safety and control functions. While these manufacturers understand that safety and control functions must be separate, they also know that the two can work in concert with each other to improve operating efficiency and productivity.

In a recent Aberdeen Group study, 74 percent of best-in-class manufacturers said they used integrated safety technologies to improve diagnostics and reduce unscheduled downtime. Such technologies include integrated safety controllers, which combine safety, discrete, motion, drive and process control in one chassis. These solutions can be connected to plantwide information systems, giving plant operators visibility into metrics such as downtime reports, and machinery and line efficiency.

As manufacturing systems continue to become larger, point-to-point wiring becomes increasingly more costly and difficult to maintain – often leading to premature machinery failure.

“Transitioning from a traditional hardwired system to a contemporary networked system gives manufacturers more flexible, reliable and cost-effective operations,” said Pat Barry, safety regional marketing lead at Rockwell Automation. “Whether using integrated safety controllers or other network devices, these contemporary systems help simplify a manufacturer’s operating structure, making product changeovers easier and enhancing OEE.”

The Safety Maturity Index Assessment Tool

The SMI tool gives manufacturers visibility into their safety programs and the ability to optimize them. It can help an organization measure and evaluate its safety program against the three key pillars – culture, compliance and capital – on a scale of one to four.

- **SMI 1: Minimizing investment** – For manufacturers who fall into this category, production throughput and cost reduction are the top priorities. Safety incidents are frequently hidden. There may be high incident rates, high insurance costs, fines and/or employee complaints to government agencies. Incomplete or improper use of safety technologies exacerbates the problem.

- **SMI 2: Attaining compliance** – For these manufacturers, safety is important, but minimal compliance is the most important part of the safety program. They often use safety technologies such as relays, which separate safety from core or standard machinery operation.
• **SMI 3: Cost avoidance** – Companies in SMI 3 consider safety a high priority but not necessarily a true value. Most safety incidents are reported properly, but some may be discovered after the fact. Compliance processes are established but may be applied inconsistently. Safeguarding technologies are used as a supplement to the standard control system. Safety is the goal, rather than operational excellence.

• **SMI 4: Operational excellence** – For SMI 4 manufacturers, safety is considered vital to the health of the business and its employees. Safety is an inherent value, and everyone is held accountable and willingly accepts responsibility for themselves and the safety of their coworkers. Compliance processes are clearly defined, and even suppliers must live up to required safety standards. The company conducts thorough risk assessments, follows the Functional Safety Life Cycle, and uses advanced safety technologies to improve worker safety and OEE.

Plant operators can complete a self-guided assessment consisting of a series of questions for each safety category. The assessment is applicable to any industry, any plant size and any location in the world. Following the online assessment, manufacturers can see where they score in the SMI levels in safety culture, compliance and capital. More importantly, recommendations will be supplied to help drive improvement in each of the three categories and provide a roadmap to best-in-class performance.

The benefits of optimizing safety extend far beyond fewer injuries or fines. Companies that approach safety holistically across culture, compliance and capital can improve productivity, gain efficiencies and experience improved employee morale – while also protecting their brand reputation.
Call a Rockwell Automation sales office today to discuss how to assess your company's safety maturity. The self-guided SMI online assessment tool will be available in November 2013.

To access the SMI, visit http://www.rockwellautomation.com/go/smiwp.