

A photograph of two construction workers in a hard hat, one yellow and one blue, looking at a tablet. The background is a blurred construction site. The image is overlaid with a blue gradient and several semi-transparent blue circles.

INTELEX

INSIGHT REPORT

Safety Management Systems: Building a Foundation on Data



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Introduction

The collection of activities, policies, processes, tools and procedures that make up a safety management system (SMS) is a whole much greater than the sum of individual parts.

Integration is the key as an SMS is designed to protect workers from job-related injuries and illnesses; identify and mitigate physical, chemical and biological hazards in the workplace; and improve environment, health and safety (EHS) training.

All SMSs share similar foundational elements. They are based on continuous improvement and typically work in conjunction with other business processes. In fact, Blaine Hoffman, producer of the [SafetyPro Podcast](#), says the latter is a vital consideration and he encourages safety professionals to do their homework in understanding other parts of the business and organization where they work before stepping into an SMS.

“Do a couple of tours of duty in the quality department or in engineering and look at how they solve problems,” he says. “What all safety management systems in the end require is the ability to integrate with other business processes. You need to determine that before even considering the implementation of a safety management system. (Ask yourself) do we have the infrastructure built to support the systems approach? That’s key.”

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The scope and maturity of an SMS varies by industry type, location and company because some are more regulated than others and that dictates the level of maturity and robustness a system requires. However, there are common components every EHS management system has, including:

- **Incident Reporting** to capture, track, investigate and report on all incidents and near-misses, including injuries and illnesses, spills, property damage and vehicle incidents.
- **Audit Management** that includes scheduling, tracking, data collection and reporting for all internal or external audits to simplify and ensure compliance across all company locations and operating jurisdictions.
- **Document Control** that improves document management across the complete lifecycle of an organization's compliance efforts and activities. It's important to control access to sensitive files, forms and reports while preventing errors, reducing risk and improving visibility.
- **Training Management** that makes it easy to plan and track EHS training for a global workforce. Worker education and training is critical to building a robust and resilient health and safety culture while staying on top of diverse and always evolving industry regulations.
- **Regulatory Compliance** which means adhering to key EHS regulations/directives and being able to prove it to the appropriate regulatory entities. This involves understanding the standards and regulations applicable to your industry and operating locations, collecting, analyzing and reporting all required data and proving compliance through inspections and audits.

Establishing an SMS is only the beginning.

"You always have to keep in mind that, even though you have it, there's always room for improvement," says Malcolm Jacobs, the senior director for environmental health and safety at TDX Holdings in Anchorage, Alaska. "You've got to continually find the chinks in the armor and refortify that. You've got to build your front to combat against the enemy of hazards."

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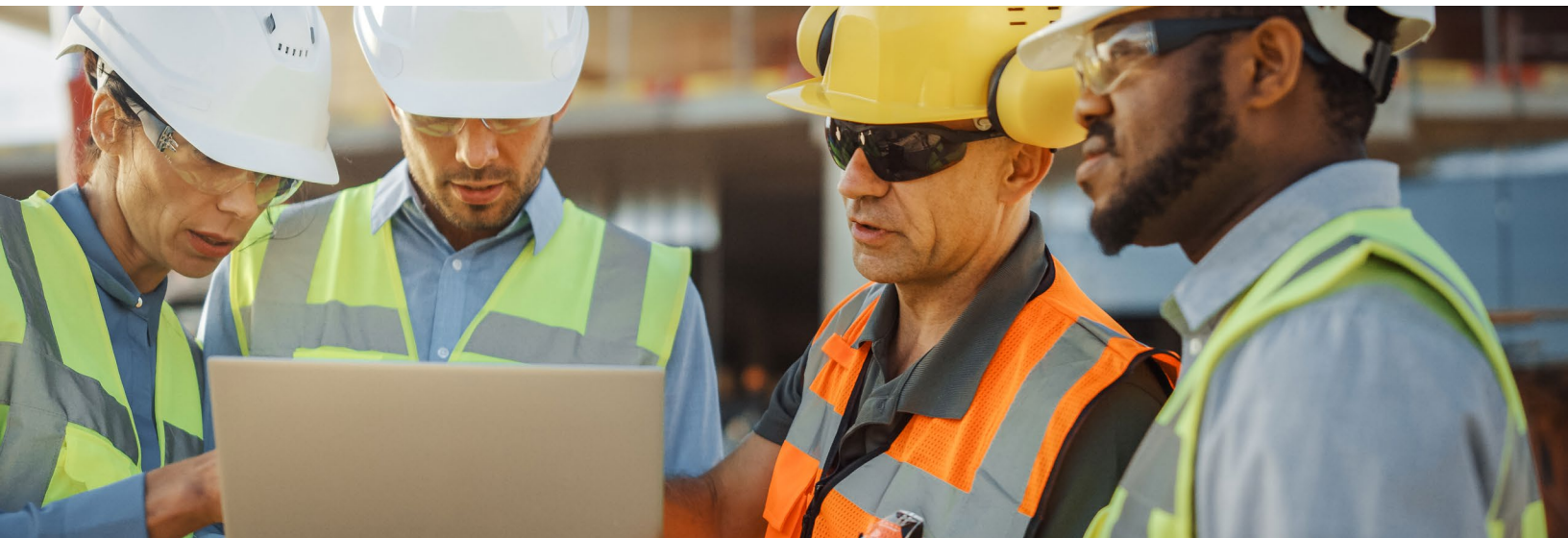
ISO 45001 and ANSI Z10

Industry standards exist to help set the foundation for a safety management system. For those who may not have a system in place or are looking to take an existing SMS to the next level, standards offer a guiding blueprint for the key and necessary components and practices. Two of the most common and ubiquitous are the International Organization for Standardization's ISO 45001 and the American National Standards Institute's ANSI Z10.

ISO 45001 is described as the world's first international standard for occupational health and safety systems. It provides a framework for improving performance and is intended to control the factors that may result in injury, illness or death on the job. ISO 45001 is also described as process-based and considers risks and opportunities. The standard explicitly mentions mental health as an element that should be protected by the program. Another noteworthy feature of ISO 45001 is that stakeholders in the safety program should include those beyond employers and employees and target the local community potentially impacted by the activities of an organization. ISO 45001 is intended to encourage the perception of health and safety, not as a stand-alone department or activity, but as a practice integrated across all areas and activities and supporting overall business success.

The stated purpose of ANSI Z10 standard is to provide organizations with an effective continuous improvement approach to occupational health and safety performance. The general structure and content of ISO 45001 and ANSI Z10 are similar, but there are areas where Z10 is more comprehensive and slightly different than certain sections of ISO 45001. One of the most important statements Z10 makes is that, whenever practical, an organization's SMS should be integrated into already existing business practices. The Z10 standard focuses mainly on the strategic aspects of how of health and safety policies are carried out but does not spell out things like detailed procedures or job instructions.

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Z10 is based on United States laws and regulations, business practices, labor relations and health and safety approaches, whereas ISO 45001 considers business practices, approaches to health and safety, legal and regulatory requirements from international ISO member countries. The information in the chart below comes from the [American Society of Safety Professionals \(ASSP\)](#) and compares these two standards.

COMPARISON OF ANSI Z10 AND ISO 45001 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM STANDARDS		
ANSI Z10	OR	ISO 45001
<ul style="list-style-type: none"> Comprehensive, systems-based standard 	PRIMARY FOCUS	<ul style="list-style-type: none"> A global standard for OSH management systems
<ul style="list-style-type: none"> Designed to align with ISO 45001 for organizations desiring conformance with both standards. Considered the gold standard of OHSMS in the United States. 	UNIQUE CHARACTERISTICS	<ul style="list-style-type: none"> Can help create a global foundation of worker safety standards and inspections that can be used by all global supply chains covering contractors and subcontractors in every country that supply products into these supply chains.
<ul style="list-style-type: none"> Not being currently used by certification bodies. 	CERTIFICATION	<ul style="list-style-type: none"> Developed with the goal of certification along the lines of other management systems standards such as ISO 9001 and ISO 14001. Organizations certified to OHSAS 18001 must migrate to ISO 45001 by September 2021 to maintain their certification.
<ul style="list-style-type: none"> Easier to understand and implement, based on United States business practices, legal system, and union/management relations. 	EASE OF USE	<ul style="list-style-type: none"> With 64 countries involved, consideration was given to a wide array of cultures, business practices and legal systems.
<ul style="list-style-type: none"> Only available in English. 	LANGUAGE	<ul style="list-style-type: none"> Written in International English. Language compromises were necessary to accommodate translation and practices in countries around the world. This standard is available in many languages.
<ul style="list-style-type: none"> Provides flexibility in tailoring its requirements to an organization's safety and health risks. 	FLEXIBILITY AND SCALABILITY	<ul style="list-style-type: none"> Does have some flexibility but is more specific in some sections.
<ul style="list-style-type: none"> Includes an occupational health section with a strong emphasis on health. 	OCCUPATIONAL HEALTH	<ul style="list-style-type: none"> Not as focused on occupational health as the Z10 Standard.
<ul style="list-style-type: none"> Much greater emphasis on worker participation than ISO 45001. 	WORKER PARTICIPATION	<ul style="list-style-type: none"> Very extensive but more specific on worker participation than ANSI Z10 due to certification requirements.
<ul style="list-style-type: none"> A Guidance and Implementation Manual is available. ASSP offers a guidance document for smaller organizations at no cost. 	IMPLEMENTATION AND SUPPORT	<ul style="list-style-type: none"> A Guidance and Implementation Manual is currently in development. ASSP sells the US adoption of the standard and it costs much less than the International version.

"I probably like Z10 better (than ISO 45001). If you lay them side-by-side, they're fairly comparable," says Scott Gaddis, the vice president and global practice leader for safety and health at Intelix Technologies. "ISO (45001) allows you the ability to do what you think are the best things to do. It's almost written as performance guidelines.

"Z10 is also written as a performance guideline, but it explains what (the processes) should look like. It's almost like an audit (that explains) here's what your auditor will be looking for. I like how Z10 goes after what I call the predictable elements of a management system."

The Data Collection Components of SMSs

Safety Audit

Safety audits are a staple of safety management systems and performed to measure the effectiveness of occupational health and safety programs as well as identify deficiencies. During an audit, an organization would evaluate its safety controls, assess whether employees follow safety processes, gauge equipment performance and operations, measure best practices and validate recordkeeping.

Information collected during an audit identifies hazards, assesses the effectiveness of safety measures to control those hazards, and determines whether an organization complies with OSHA requirements. Safety audit data sources include:

- Incident reports
- Equipment inspections
- Safety training completion reports
- Documented work practices
- Equipment inspection reports

Regulatory Compliance

OSHA standards provide specific environmental guidelines and limits for the utilization of safety practices, equipment and tools by employers to protect employees from workplace hazards. OSHA standards apply to a wide range of industries and to most worksites. These include:

- Fall protection requirements
- Trenching cave-ins protections
- Infectious diseases protections
- Confined spaces safety
- Harmful substances exposure prevention
- Machine guarding
- Safety equipment
- Dangerous jobs training

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Data requirements for OSHA regulatory compliance include records of serious work-related injuries and illnesses. [According to OSHA](#), these records must be maintained at a worksite for at least five years. Each February through April, employers must post a summary of the injuries and illnesses recorded in the previous year. Also, if requested, copies of records must be provided to current and former employees, or their representatives.

Incident Reporting

SMSs facilitate incident data collection through intuitive forms, simplified templates and auto-filled fields. Mobile applications in use by many organizations allow users to report incidents in real time and upload things like photographs and documents directly to a single centralized location. Data requirements for an incident report include incident types (injury, near miss, property damage or theft); the incident date, time, location and individuals affected; plus, a description of the incident including the sequence of events and results.

Root Cause Analysis

To resolve the underlying factors and conditions that pose hazards and may have led to an incident, it's necessary to understand the root cause. Root cause analysis is essentially problem solving. The tools of SMSs provide the means to an end of workplace hazards and incidents using collected data that's analyzed and evaluated to ultimately reveal concerning trends, which can then be corrected. Compatibility with and accessibility to other systems and data is vital to root cause analysis as teams across an organization need to share and coordinate on examining reoccurring and costly incidents. Check out [Intelex's Safety Management Software](#) that makes it easy to manage your organization's Health and Safety program.

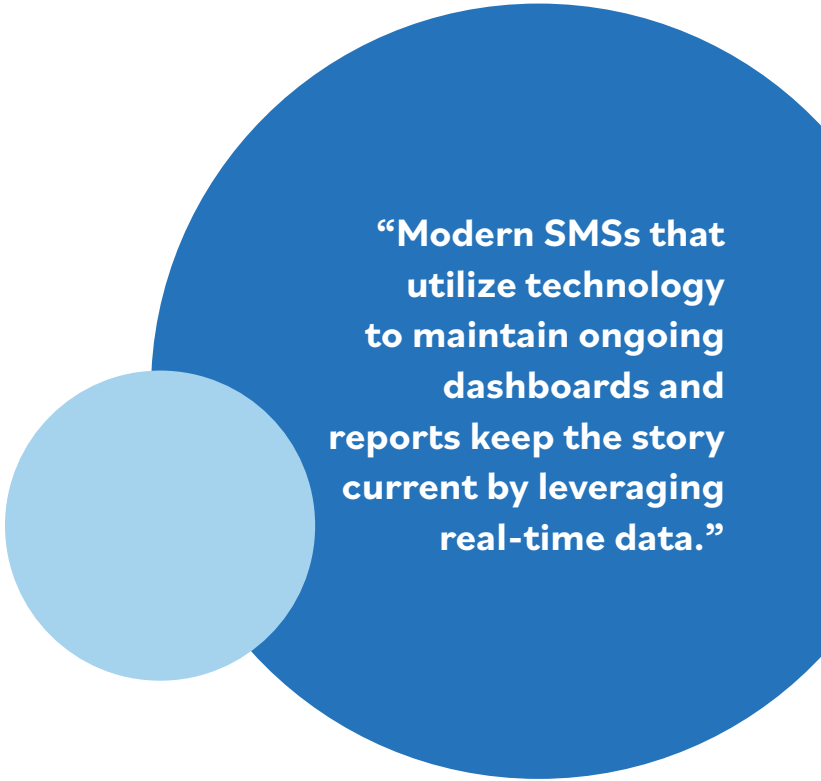
Reporting and Analytics

Reporting and analytics bring order to difficult to comprehend data. Traditionally, data collection and information analysis often involved painstaking manual and time-consuming effort, which often resulted in reports created from out-of-date data. Modern SMSs that utilize technology to maintain ongoing dashboards and reports keep the story current by leveraging real-time data.

An integrated health and safety management system taps into safety processes, training status, compliance requirements, hazard data and incidents from a centralized source. That provides up-to-the-minute, accurate data, and combined with analytics, spot early-warning hazard signs, identifies important trends and monitors incidents. Deloitte’s Workplace Safety Analytics report shows data sources for analytics, below:

Examples of Safety Analytics Data Sources			
Safety Data	HR Data	Context Setting	External
HSE Efforts	Rosters	Incident Context	Stakeholder Benchmarks
Audits	HSE History	Task Variation	Culture
Investigations	Performance History	Site Variation	Sociodemographic
Incidents	Training Skills	Equipment	Geospatial
	HRIS Profile	Production Complexity	Time of day
			Weather

Source: [Deloitte Workplace Safety Analytics](#)



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The Role of Technology

With data now so abundant and easier to collect, the challenge becomes separating what could be life-changing – or worse, life-ending – from everything else. Technology can help to gather more data and information so that health and safety leaders are able to learn more and makes it easier for people to fill in information to save them time. It also makes it possible to surface key metrics through an easy-to-use dashboard.

“Safety professionals want to see a connection of data so they can make a decision.”

**Scott Gaddis,
Vice President and
Global Practice Leader
for Safety and Health,
Intelix Technologies**

Through technology it’s possible to explore data blackspots and be aware of – as James Pomeroy, the global health and safety director at global professional service company Arup says – “Who’s not talking to us and who are we not having a conversation with and learning from?”

Technology is a vital tool that safety professionals might use to – as Gaddis explains – assist them with an answer. “Safety professionals want to see a connection of data so they can make a decision,” he says.

Across health and safety, the focus for analyzing incident information has traditionally been grounded in structured data. Today, however, important data exists as unstructured free field text from which some of the most insightful learnings can be gained. While analyzing unstructured data is more difficult and time-consuming, advances in artificial intelligence technology solutions such as [ehsAI document deconstruction software](#) make it easier to pick up key words and phrases that can unlock this insight and accelerate the process.

With innovations such as predictive analysis, it's possible to move beyond a purely retrospective view and begin to make assessments about the future. It's a powerful tool for creating effective future-focused strategies. While some risks can be mitigated using technology and automation, it is almost always a human decision that drives real-world action. It's important for technology to be seen as an enabler rather than a substitute for people doing the right things to keep themselves and their colleagues safe.

Ultimately, technology and data exist to serve a purpose – making it easier and faster for people to report incidents and for health and safety professionals to better understand these risks and take the appropriate steps. With today's technology platforms, it's now possible to radically streamline and simplify processes that would have previously been, and sometimes still are, slow, manual and inefficient.

Free Help is Available

If ISO 45001 or ANSI Z10 aren't the frameworks your organization feels equipped to follow as a template for its SMS, there is other simpler and free guidance available to help you get started. Jacobs recommends looking to your workmen's compensation insurance provider.


"If you have a good program you're saving them money," he says. "They may have sample programs for different activities and some even have guidance to share on developing your hazard analysis. They'll also have a team that could come to your company to observe and make recommendations for your ergonomic programs."

Jacobs adds that insurance companies are often willing to do a safety audit of your organization which you can then use to measure against your own audit for comparison. During their audit, insurers may make a list of deficiencies which you can then correct. Some insurance companies offer safety training that they'll often provide onsite for your employees.

"Insurance companies offer quite a bit," he says. "It just depends on your provider and it's always worthwhile to get on the phone and speak with them. When you purchase insurance, they certainly ask you a lot of questions so it's only fair that you can ask them questions, too."

OSHA's Voluntary Protection Program or VPP is another great option and a good place to start when thinking about a SMS.

"Employing your country or state OSHA organization is an excellent resource," Jacob says. "If you look at their check sheet for building a VPP program, it follows the Z10 and ISO 45001 standards closely. The program also gets you involved with other companies that have been



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through VPP and have safety management systems in place. Many are willing to share their audits with you and provide feedback.”

And some final advice from Jacob for those looking to implement a safety management system:

- Review relevant information that’s available on safety management systems
- Look at your organization and determine what’s currently in place, what’s needed or what can be improved
- Build relationships with your organization’s management and with your workforce
- Understand the mission of the company and where it is going in the future and make sure your plan incorporates your company’s business vision
- Benchmark and follow the best practices of other companies that already have and utilize a SMS
- Join safety professional networks, communicate your ideas with them and listen to the best practices offered by others.



Intelex Safety Management

EHS software streamlines and automates your EHS management system by collecting, storing and analyzing EHS data from your entire organization in a single, centralized repository. It automatically recognizes and tracks changes in applicable EHS regulations and standards to maintain compliance while making it easy prepare mandatory documentation for audits and inspections. EHS software tracks incidents and illnesses for analysis so you can identify their root cause and create [CAPA \(Corrective and Preventative Action\)](#) plans that prevent reoccurrence.

[Intelex EHS software](#) simplifies the management of your organization’s environment, health and safety programs to protect profits, people and the planet.

Free Trial

If you would like a free trial of our software solution, please click [here](#). You will have the opportunity to experience the basic “plug-and-play” software before making a commitment.

Free Demo

If you would like a demonstration of our software solution, please click [here](#). This includes a product tour and a conversation with our software experts.

Pricing Information

If you would like to receive a custom quote or pricing-related information, please click [here](#). This includes the total business value that our software will provide, projected ROI, financial benefits via a “hard dollar” analysis and total business benefits via a “soft dollar” analysis.

About the Author

Dan McLean

Dan McLean is a senior content marketing manager at InteleX Technologies. He has been an information technology editor and writer for more than 25 years and spent seven years as an IT market research director for International Data Corporation in Canada. In addition, Dan directed content marketing teams for Rogers Communications, OpenText Corporation and Vendasta Technologies, plus was a senior executive communication manager at Cisco Systems for eight years.

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