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Feature Article



Jayanta Bhattacharya

Hony. Chief Editor

To Avoid Accidents in Mines and Plants Adopt Safety System Standardization and Safety Management Certification Processes

Safety has to be everyone's responsibility… everyone needs to know that they are empowered to speak up if there's an issue." – Captain Scott Kelly. (Check out Made Extraordinary Summit 2021).

Keywords: *Accident, Certification, Mines and Plants, Standardization*

Background

Safety system standardization is the process of developing and implementing standards to improve safety, quality, and process repeatability. Standardization is particularly helpful in the formative stages of a given market. Standards can focus demand for innovations that might otherwise be spread over multiple technical solutions. Standards are especially important in network industries, such as ICTs, in that they can facilitate a critical mass of users. In this connection, standards ease the emergence of technological platforms - independently supplied yet inter-operable components with shared technical standards. Many successful platforms, such as the Internet and the cellular telephone, are based on open standards. It can be a crucial step towards operational safety excellence, and can help to:

a. Make processes safer and more effective.
b. Reduce ambiguity and guesswork.
c. Increase employee morale.
d. Improve important processes.
e. Create a safety culture.
f. Share experiences.
g. Capture lessons learned.
h. Cooperate for continuous improvement.
i. Avoid waste.

Key Benefits of Safety System Standardization

Following are the benefits[1,2]:

1. Streamlined Compliance: Prepare for regulatory complexities with ease. Ensure full compliance with industry-specific regulations throughout all project stages.
2. Comprehensive Risk Management: Identify issues early and effectively mitigate risks – even unforeseen ones - with thorough hazard and harm identification and risk assessments, utilizing both qualitative and quantitative methods.
3. Enhanced Project Reliability: Improve system reliability and minimize unscheduled downtimes with techniques such as HAZOP, HAZAN, FMEA, FMECA and fault tree analysis, prolonging asset lifespans.
4. Cost-Effective Solutions: Optimize budget with strategic resource management reducing waste and cutting unexpected costs, maximizing return on investment.
5. Customized Safety Measures: Align safety strategies customized to the project's needs, ensuring maximum effectiveness and efficiency.
6. Ongoing Support and Monitoring: Maintain high safety standards with continuous inspection, operational safety monitoring and expert support, adapting to project scope changes and evolving regulatory requirements.

Appoint Safety Specialists

1. To enhance mine and plant's safety and efficiency with the following services, employ the people with knowledge[3,4]:
2. Hazard Identification: Utilize advanced techniques like HAZID, HAZOP, FMEA, and PHA for early and systematic risk detection in the design process.
3. Risk Assessment: Apply both qualitative and quantitative methods to thoroughly evaluate and address risks, ensuring broad coverage.
4. Safety Requirement Specification: Craft and specify precise safety requirements that govern all design and development stages, aligning with safety regulations.

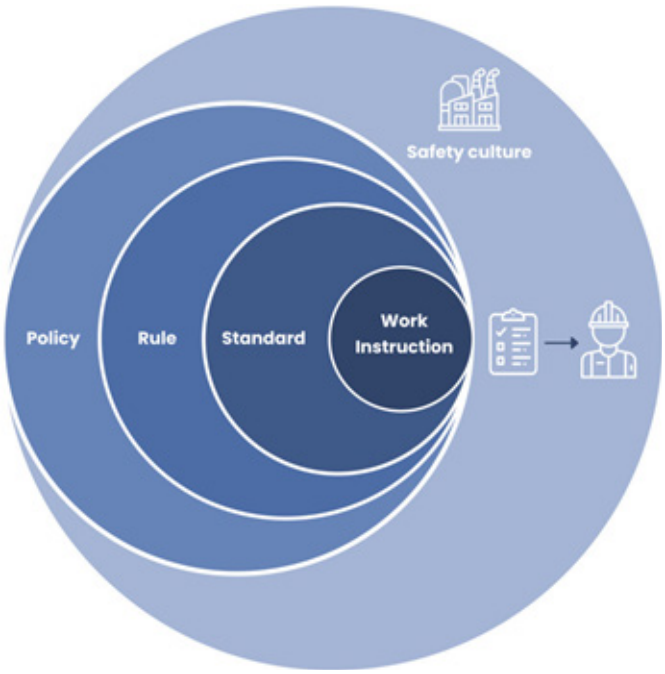


Figure 1. Developing safety culture via standardization.

5. Safety Lifecycle Management: Oversee all safety aspects from the project's inception through to its operation and maintenance.
6. Operational Safety Monitoring: Monitor safety performance continuously during the operational phase with advanced technology that adapts to changes and maintains high standards.
7. Regulatory Compliance Assistance: Expert guidance and support to navigate the complexities of industry-specific regulations, ensuring ongoing compliance.
8. Training and Workshops: We provide workshops and training sessions to educate the team on current safety standards, best practices, and emerging trends in system and process safety engineering.

"Every accident is a notice that something is wrong with men, methods, or material - investigate - then act." - Unknown.

"Safety is not an intellectual exercise to keep us in work. It is a matter of life and death. It is the sum of our contributions to safety management that determines whether the people we work with live or die." - Sir Brian Appleton, Technical Adviser to the Enquiry on Piper Alpha Accident.

Safety Management System Certification (SMSC)

SMSC can help organizations improve workplace safety and health, and demonstrate compliance with health and safety laws. ISO 45001 is an internationally recognized standard for Occupational Health and Safety Management Systems (OHSMS). It can help organizations[3-5]:

a. Prevent work-related injuries and illnesses.
b. Promote a culture of safety.
c. Continually improve OH&S procedures.
d. Increase organizational resilience.



Figure 2. Phases of process safety management.

e. Strengthen legal and regulatory compliance.
f. Demonstrate brand responsibility.
g. Meet customer and consumer expectations.

"If you put good people in bad systems, you get bad results. You have to water the flowers you want to grow." - Stephen Covey

Role of External Experts and Audits

Independent audits are crucial and delve into the responsibilities of PCBUs, Safety Officers, and Legal Teams in ensuring competent external parties conduct these audits[4-6].

Importance of Independent External Audits

1. Objective Evaluation: Independent external audits provide an unbiased assessment of a company's safety system. By engaging a competent external party, companies can gain an independent perspective on their safety practices, identifying areas of improvement that may have been overlooked internally.
2. Compliance Assurance: Audits conducted by external parties ensure that companies are compliant with legislative requirements. Compliance with safety standards protects the workforce, reduces the risk of accidents and incidents, and shields the company from legal and reputational repercussions.
3. Industry Best Practices: External audits enable companies to benchmark their safety system against industry best practices. This comparison allows them to stay informed about emerging trends, innovative safety measures, and technological advancements, thus enhancing their own safety protocols accordingly.

Responsibilities of PCBUs:

1. Selection of Competent External Party: As the Person Conducting a Business or Undertaking (PCBU), it is the responsibility of the company to engage a competent external party for conducting independent audits. PCBUs should thoroughly evaluate the skills, competencies, and experience of potential auditors to ensure their qualifications align with the company's safety needs.
2. Collaboration with Safety Officers: PCBUs must closely work with their Safety Officers to identify and communicate the scope and objectives of the external audit. Safety Officers can contribute their expertise and provide necessary documentation to support the audits effectively.

Responsibilities of Safety Officers[5,6]:

1. Audit Preparation: Safety Officers play a crucial role in preparing the necessary documentation, including policies, procedures, incident records, and risk assessments, for the external audit. They must ensure that all relevant information is readily available to assist the auditors during the evaluation process.
2. Facilitating the Audit Process: During the audit, Safety Officers should coordinate with the external audit team, providing them access to relevant areas, personnel, and records. They must be available to answer any questions and provide clarifications as required by the auditors.

Responsibilities of Legal Team:

1. Contractual Negotiations: Legal teams play a pivotal role in negotiating agreements with external auditors. They should ensure that the contract clearly states the scope, objectives, deliverables, and timelines of the audit. Additionally, legal teams must include provisions for confidentiality, liability, and any other legal aspects that may arise during the audit process.
2. Compliance Assessment and Advisory: Legal teams should collaborate with the auditors to assess the company's compliance with safety regulations and other legal obligations. They can provide necessary guidance to the PCBUs and Safety Officers on any legal implications or potential liabilities discovered during the audit.

Role of External Auditors:

An external auditor's role in safety is to evaluate an organization's safety programs and procedures, and ensure they comply with laws and regulations. External audits can help organizations in several ways[5,6]:

Compliance

External audits can help ensure compliance with health and safety laws and regulations.

Identification of areas for improvement

External auditors can help identify weaknesses and areas for improvement.

Benchmarking

External audits can help organizations benchmark their safety performance against industry standards and best practices.

Unbiased perspective

External auditors are independent of the organization they audit, which can help them provide an unbiased perspective.

Specialized expertise

External auditors often have specialized knowledge and experience in safety management systems, regulatory requirements, and industry best practices.

When selecting an external auditor, it's important to carefully choose the auditor, establish clear terms and conditions, and maintain effective communication and collaboration.

Certification and Standardization of New Technology Adoption

Standards and certification measures are tools used to ensure that products, processes, and systems meet specific established criteria or specifications. These criteria may relate to safety, performance, quality, or other characteristics that are important for the intended use of the product or system. It has the following steps[6,7]:

1. Metrology establishes the standards and methods used to measure and quantify physical quantities. This can include metrics ranging from basic units of length, mass, and time, to more specialized measurements used in specific fields such as electronics or medicine.

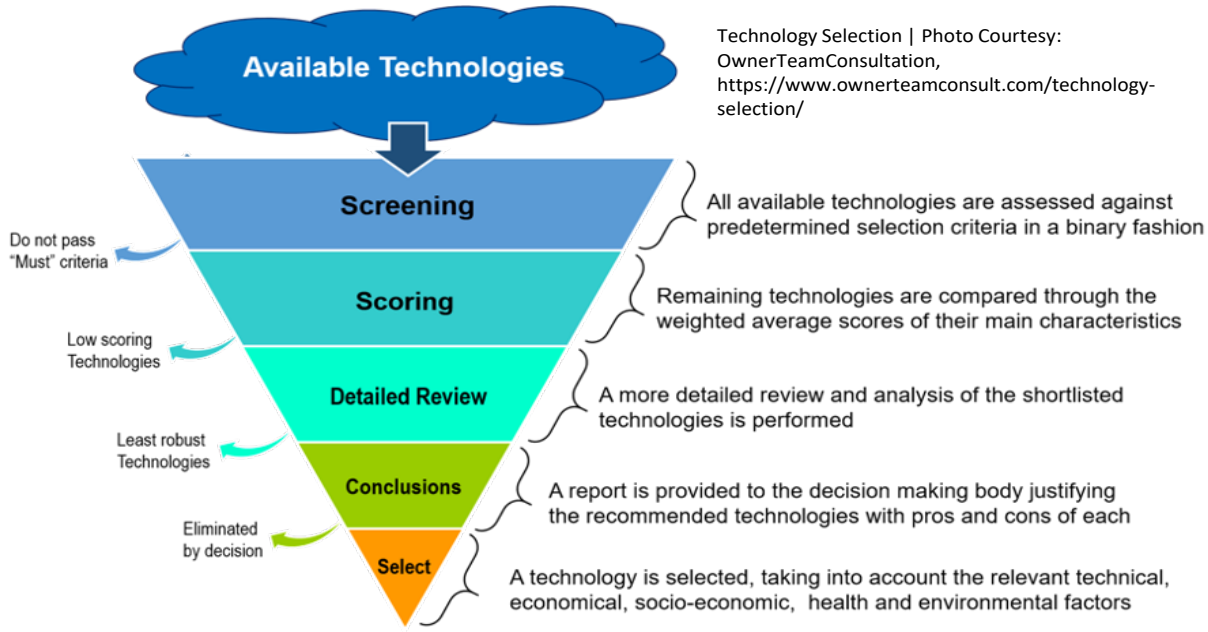


Figure 3. Choosing a new technology.

2. Inspection examines products, processes, or systems to ensure they meet specific criteria or standards. It can involve visual inspection, testing, or other methods to evaluate a product's or system's characteristics.
3. Conformity assessment is the process of evaluating whether a product, process, or system meets specified requirements. Through accreditation, organizations are appraised and recognized as competent to perform specific conformity assessment activities.

These various standards and certification measures play a critical role in promoting the development and adoption of technology. By establishing clear criteria and methods for evaluating products, processes, and systems, they help ensure that new technologies are safe and reliable. This, in turn, helps to build confidence in the technologies among consumers and other stakeholders, which can encourage their wider adoption and use.

Standardization is particularly helpful in the formative stages of a given market. Standards can focus demand for innovations that might otherwise be spread over multiple technical solutions. Standards are especially important in network industries, such as ICTs, in that they can facilitate a critical mass of users. In this connection, standards ease the emergence of technological platforms - independently supplied yet inter-operable components with shared technical standards. Many successful platforms, such as the Internet and the cellular telephone, are based on open standards.

The Development of Technical Standards: The Challenges

1. Unlike regulation, the setting of standards is mainly the responsibility of industry bodies – with government acting as facilitator or coordinator (the public sector's role largely involves measures to include under-represented groups in the process of developing standards).
2. This has practical implications: procedures in standards bodies can be slow and bureaucratic and can be held up by large players, which raises the important issue of timing. The timing challenge – which offers no easy solution – refers to the possibility that inappropriate timing in the introduction of a standard could lock businesses into an inferior standard and hinder further innovation[6-8].
3. Another potential problem with standards is that they might be captured by a single company. That becomes its intellectual property and has business scopes.

4. Innovation and, in particular, the networked character of the information economy, require active standards-setting (for instance for complementary system components and interconnected networks). But anti-trust and non-disclosure agreement concerns exist here on two main issues:
    a. The first concerns a defining of the limits to co-operation in standard setting: most standard-setting bodies limit the scope of issues that can be discussed, excluding product pricing.
    b. The second main concern relates to behavior that might allow a single firm to control a standard. To counter this danger, all standard-setting bodies require the collaborating parties to make available any intellectual property needed for compliance with a standard (either royalty-free or on the basis of so-called 'friendly royalties').

There is a trend towards standardization work being conducted at the international level because, in a globalized economy compatibility and interface across borders are important. Competitive disadvantages could arise if a country were to free ride on the standards setting work of others. Countries and firms that play primary roles in setting international standards can enjoy advantages from doing so, to the extent that the new standards align with their own national standards and/or features of their productive base.

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