CORESAFETY®
Committed to Excellence in Mining Safety

Handbook

About **CORE**Safety and Health Management System

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Introduction

About Safety and Health Management Systems

Overview

Management systems all share the "Plan, Do, Check, Act" (PDCA) model and emphasize continuous assessment of the effectiveness of processes and their results. PDCA is briefly summarized as involving:

Plan

- Gain "systems" knowledge
- Define the scope of the system by establishing objectives and processes necessary to deliver results in line with your organization's health and safety policy
- Develop basic structure
- Assign responsibilities and fix accountability

Do

- Implement the processes—the system structure
- Ensure personnel know what to do
- Communicate excessively

Check

- Monitor and measure progress against your policy, objectives, legal and other requirements and report the results
- Verify function as designed

Act

- Take corrective and other actions to continually improve safety and health performance

These systems are in place all around us because of their success in achieving and sustaining world-class performance.

Safety and health management systems are designed to provide guidance and structure through proven methods for managing safety and health. Systems can be customized for a mining company and its operations, or they can be variations on established safety and health management systems (SHMS) such as ANSI Z-10 or OHSAS 18001.

Introduction

The **CORE**Safety management system is consistent with Z-10 and 18001 and was developed specifically for U.S. mining operations by experienced mining safety professionals. Companies with an existing safety and health management system can use the **CORE**Safety gap assessment tool to determine if improvement opportunities exist.

How Systems Differ from Programs

Programs tend to be narrowly focused and disconnected from other factors such as planning, leadership roles, communications, etc., that are key to performance. Programs generally have a start, a middle and an end that are designed to ensure the prescribed requirement has been completed.

Systems, on the other hand, are integrated and have a defined structure with inputs, processes and outputs—all emphasizing feedback to ensure the processes are working properly. The Plan, Do, Check, Act cycle is designed to drive continuous improvement in safety and health performance and in the processes that result in good performance.

You can learn more about management systems at safety conferences, short courses at universities and in professional literature, in addition to the information provided here.

Why Management Systems Succeed

Here are five key reasons why SHMSs succeed:

1. Customization:

a. The SHMS is designed and implemented to reduce or eliminate risks specific to the organization.

b. The system also is customized to the organization and is not an off-the-shelf generic system. One size does not fit all.

2. Leadership:

a. Senior management makes good decisions to reduce or eliminate risk and doesn't assume the system will make the decisions for them.

b. Management support is regular and consistent and ensures the system is integrated and afforded importance by all affected departments and parties within the organization.

Introduction

3. Ownership:

a. The system is owned and understood by those that live with it and is not just developed in response to external demands.

b. The system is owned and managed by senior management. Lower line senior management do the work of making the system work.

c. Front line managers and workers know their roles in the system and were involved in its development and implementation.

d. The system works operationally on a daily basis.

4. Assurance:

a. The system is constantly reviewed for its effectiveness and is not merely viewed as a paper battle in which procedures are followed to comply with the system, regardless of effectiveness.

5. Patience and Communication:

a. Parts of the organization and individual employees are likely to progress, or even take ownership, of the system at different rates. Don't give up, and don't stop communicating.

The **CORE**Safety modules provide more specific guidance on how effective SHMSs are developed, implemented and improved.

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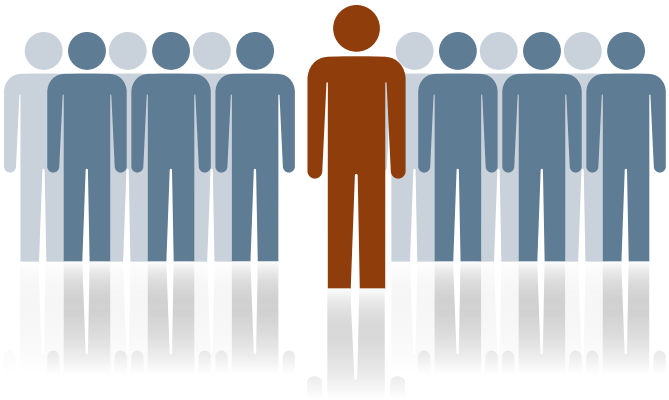
Overview

The **CORE**Safety Safety and Health Management System (SHMS) involves 20 modules with suggested timelines for completion.

The modules and timelines were developed by mine safety professionals specifically for U.S. mining as a pathway to achieve zero fatalities and a 50 percent reduction in the injury rate within five years (0:50:5).

While **CORE**Safety provides a common roadmap and a common language to achieve 0:50:5, it does not specify the details of each company's system. Rather, company systems should be designed to be functionally equivalent to the **CORE**Safety SHMS taking into consideration each company's unique operations, management structure and culture.

Leadership Development



Identifying and developing employees in leadership positions or with leadership potential who can:

- Influence safety and health performance improvement.
- Positively and knowingly affect safety culture.
- Help the organization achieve the 0:50:5 objective.

Leadership development is a process that begins with leaders understanding their strengths and weaknesses. This understanding helps leaders focus on areas of potential improvement.

To effectively influence safety and health performance improvement, leaders should:

- Hold themselves and their subordinates accountable
- Be action-oriented
- Be collaborative
- Be an effective communicator
- Have integrity
- Provide effective performance feedback
- Be systems-focused
- Have a personal vision and passion for safety excellence

Identifying Potential Leaders

Determining who is a safety and health leader will affect your approach to leadership development.

Think carefully about leaders in your organization. Is it top line managers? What about staff positions? Is it anyone who can control their own behavior and influence others? If the latter is

true, there are a number of strong leaders among the entire workforce, including non-salaried positions. Determining who is a safety and health leader for the purpose of achieving the 0:50:5 goal will affect your approach to leadership development.

Linking Leadership Development to Other Processes

Some people are natural leaders. The majority of leaders, however, can benefit from additional development of their leadership skills. Development does not end at the conclusion of leadership training. It should link to the company's performance management and succession planning processes. Leaders who are held accountable, by themselves and by the company, will have far greater success in making change permanent and positive. They also will have greater success in enhancing the organization's culture and ensuring adequate resources to achieve the 0:50:5 goal.

Expectations:

1.1 Ensure all leaders understand the importance of their personal leadership, their responsibility to demonstrate their leadership and commitment to 0:50:5.

1.2 Identify the desired leadership competencies specific to your company (to achieve 0:50:5) or adopt those recommended by **CORE**Safety.

1.3 Determine the level of management that will undergo leadership development: line supervisors, middle managers, senior managers, etc.

1.4 Enable managers to be assessed using 360° feedback to determine how they compare with the defined leadership competencies.

1.5 Either develop and deliver your own leadership process, or access an external development process from **CORE**Safety or a consultant.

1.6 Ensure all managers who undergo leadership development establish a personal development plan.

1.7 Link each development plan with the company's performance management program to ensure continuous improvement is sustained over time.

Leadership Development

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

1 Percentage of managers who have completed leadership development

2 Average percentage improvement in individual scores

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module1

Notes

Responsibility & Accountability

This module includes:

- Setting appropriate safety and health goals.
- Assuring all employees understand their safety and health management roles and responsibilities.
- Providing sufficient resources.
- Employing appropriate tools to measure and review for continuous improvement.
- Applying positive and negative consequences relative to performance against responsibilities.

An accountability system ensures all employees understand their specific roles and responsibilities and act consistently on those responsibilities. A successful accountability system:

- Includes all employees
- Clearly identifies the work to be conducted
- Establishes goals at all levels of the organization that are:
  - appropriate
  - attainable
  - proactive
  - directly aligned with achieving the 0:50:5 goal
  - renewed at an appropriate interval

The safety and health management system (SHMS) should contain performance measures that allow timely and meaningful evaluation of and feedback on progress toward successful completion of established goals. It should also include positive and negative consequences in the evaluation process. This begins at pre-employment and evolves with the individual and the needs of the organization.

The Role of Accountability

Employees are responsible for their own safety and for looking out for the safety of their co-workers. Consistent personal accountability is the desired state. Structured accountability also

ensures personnel live up to their responsibilities through positive and negative consequences. This requires authority.

Safety and health is a line management responsibility, and accountability is the common factor that links the various components of the SHMS. Leaders at all levels are responsible for engaging and leading the workforce to achieve 0:50:5.

Leaders should be held accountable for achieving 0:50:5 by:

- Clearly defining roles and responsibilities of their employees
- Providing necessary resources
- Measuring, reviewing and continuously improving safety and health performance
- Leading by example

Managers, employees and contractors should also understand their responsibilities for ensuring the effective implementation of the **CORE**Safety SHMS as the primary tool to facilitate progress to 0:50:5.

Employees are responsible for their own safety and for looking out for the safety of their co-workers. Consistent personal accountability is the desired state; however, structured accountability also ensures personnel live up to their responsibilities through positive and negative consequences. This requires authority.

Expectations

2.1 Identify personal and group safety and health management responsibilities for all personnel and ensure each person is aware of and acknowledges their role and responsibilities.

2.2 Identify positive reinforcements and negative consequences specific to each person's safety and health responsibilities, i.e., what will happen if they achieve or fail to achieve expectations.

2.3 Provide time, knowledge and other resources necessary for personnel to successfully complete their safety and health responsibilities.

2.4 Periodically assess performance against target for each person and provide feedback.

2.5 Conduct a final performance review and apply consequences, as appropriate, at the end of the assessment period, e.g., shift, week, month, quarter and year.

Responsibility & Accountability

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

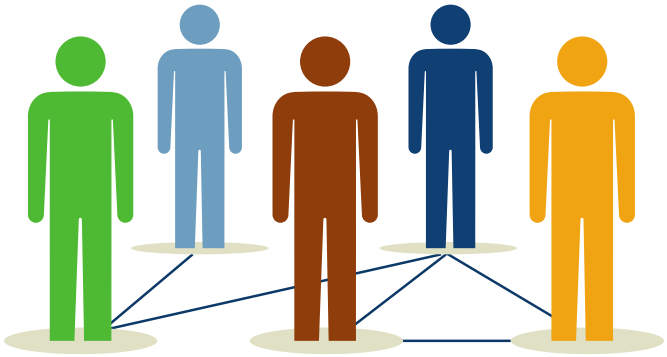
To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module2

Notes

Management System Coordination



This module includes:

- Assigning responsibility for development and management of the **CORE**Safety safety and health management system (System Leader).
- Integrating **CORE**Safety into other company systems such as mine planning, operations, maintenance, contract management, human resources, information technology and others.

A safety and health management system (SHMS) needs a system plan and someone to help steer and actively manage the system on its path forward. An SHMS is the repeatable, integrated processes, procedures and actions that result from the system plan.

Who and What

The **CORE**Safety SHMS should be managed by someone in senior management. Because it will affect many aspects of the company, not just safety and health management, it should be integrated into other company systems to be effective, e.g., planning, operations, maintenance, contract management, human resources, performance management, equipment purchasing, etc.

Documentation of the SHMS is necessary to ensure understanding, effectiveness and continuity of the system for all stakeholders. However, documentation should complement and support the system, not be end in itself, i.e., balance practical and legal need for documentation with resources required to support documentation.

Expectations:

3.1 Designate at least one senior manager (system leader) with formal responsibility for the development, implementation, operation and maintenance of the company's SHMS.

3.2 Develop a written annual S&H plan that identifies the process for developing, implementing and verifying the SHMS by 2015. Plans should be company and/or site-specific.[1]

3.3 Develop and communicate a company safety and health management policy to all employees, contractors and other stakeholders.

3.4 Ensure there is full integration of the SHMS expectations and Module 2.0 (Responsibility and Accountability). All expectations should have an internal owner(s).

3.5 Ensure the system is fully integrated into other company systems, e.g., operations, maintenance, development and planning, HR, purchasing, etc.

3.6 Ensure there is adequate documentation to develop, implement and improve the system. Documentation should be maintained through a documentation retention plan.

3.7 Define and budget the financial and time resources necessary to develop and maintain the SHMS.

Footnotes

[1] Communicate the company's commitment to comply with both legal (MSHA, OSHA, DOT, ATF, etc.) and **CORE**Safety Modules. A plan may include a timeline, a project manager, a communication plan to keep stakeholders in the loop and to gather feedback, and the resources necessary to complete the system, etc. Resources may include S&H professionals working under a project manager and/or external consultants.

Management System Coordination

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module3

Notes

Fatality Prevention / Risk Management

This module includes:

- Identifying and reviewing all safety and health hazards.
- Assessing and prioritizing risks associated with those hazards, emphasizing risks that could have catastrophic, including fatal, consequences.
- Applying controls systematically.
- Ververifying controls remain effective over time.

Risk management is the process of:

- Identifying safety and health hazards
- Evaluating the associated risk and consequences
- Developing controls to eliminate or minimize negative outcomes to an acceptable level

The goal: Eliminate the risk or reduce it to the lowest practical level

The **CORE**Safety Safety and Health Management System (SHMS) is a systematic approach to risk management that calls for:

- Reviewing *all* safety and health hazards
- Assessing and prioritizing risk
- Applying controls systematically
- Verifying that controls remain effective over time

Defining Work for High Risk Procedures

Within the process of mining-related risk management, there are two general classes of work activities that should be clearly understood, but differentiated:

- High frequency, low severity/consequence work
- Low frequency, high severity work

Both classes require effective risk assessment and controls.

Identification of work activities and situations that should be subject to a heightened examination should not be limited to those activities for which companies have had prior incidents. The presence or use of the activity, even very infrequently, is adequate justification for inclusion.

High risk work requires a greater emphasis on the application of effective controls to minimize the risk of negative outcomes, including fatalities. Each company should define those high risk activities that are most relevant to their operations and develop a fatality prevention/high risk guideline or use the sample in the **CORE**Safety resources section.

For high risk work, the application of the "hierarchy of controls" should be strongly based on the use of elimination, substitution, modification or confinement over administrative practices and personal protective equipment.

The **CORE**Safety approach necessitates different ways to proactively identify hazards in the planning, engineering, development, operations, maintenance and reclamation phases, as appropriate to the operations.

How it Works

Risk management starts with operation planning; it is conducted on an ongoing basis and is carried through to closure.

Risk assessment can involve technical staff (engineers) managers and workers with appropriate knowledge and experience.

Fatality Prevention / Risk Management

Companies should use all three categories of risk assessment tools as circumstances dictate.

The three categories of risk assessment processes are:

- Personal and pre-task (PPT)
- Systematic job and task (SJT)
- Formal, process and equipment (FPE).

Acceptable risk should be defined by management; however, risk-based decisions can and should be made by workers when they have the knowledge, training and experience.

Management should make all decisions associated with work that exceeds acceptable risk as defined by the company. Each company should define at what level controls should be prioritized based on a "hierarchy of controls" that recognizes the general effectiveness of controls and are, in descending order:

1 Elimination
2 Substitution
3 Modification
4 Confinement
5 Capture (ventilation)
6 Administrative practices
7 Personal protective equipment

Fatality Prevention / Risk Management

Expectations:

4.1 Develop and maintain an up-to-date registry of site-specific high risk activities.

4.2 Assess high risk work activities using risk assessment tools including systematic job and task, process and equipment and personal.

4.3 Develop and/or adopt site-level high risk procedures to maintain risk at as low a level as practicable.

4.4 Maintain effective informal and formal hazard identification procedures, e.g., inspections, worker feedback, task observations, pre-task assessments, etc.

4.5 Regularly audit high risk procedures to ensure full compliance and effectiveness.

4.6 Ensure internal reporting of all high risk procedure-activity near miss and injury incidents and conduct incident investigation and root cause analysis, as appropriate.

4.7 Develop or adopt a personal and pre-task (PPT) risk assessment tool [Level 1] and require workers who are at-risk in their job duties to utilize the tool before job tasks. [1]

4.8 Verify that all affected employees are educated, trained and competent relative to the high risk procedures.

4.9 Develop or adopt systematic job and task (SJT) risk assessment tools [Level 2] for routine and repeatable non-routine work. Develop documentation and train accordingly. [2]

4.10 Apply formal, process and equipment (FPE) risk assessment tools [Level 3] to the mining process, equipment, development, operations, maintenance and reclamation. [3]

4.11 Define and document the acceptable level of risk through a risk matrix (likelihood and consequences), or adopt the CORESafety generic risk matrix as a minimum guideline.

4.12 Ensure risks are evaluated by the appropriate level of management, consistent with the significance of the risk. Senior management should be included when assessing major risks and variances.

4.13 Document the company's risk management approach for all high-risk (low likelihood, high consequence) work activities and ensure consistent application of those protocols. [4]

4.14 Establish a management policy that applies the "hierarchy of controls" to hazard control opportunities and obligations. The policy should include specific criteria for variances.

4.15 Where PPE is permitted to be used in lieu of more comprehensive controls, wearers

should be trained on specific uses, proper usage and protection limitations.

4.16 Verify that controls maintain their effectiveness or are modified should circumstances change over time. Include control verification in safety and health audit criteria.

4.17 Document risk management decisions for tracking and verification purposes, and for future reference.

4.18 Ensure there is full integration of Module 4 expectations and expectations from Modules 2, 5, 11, 12 and 14.

Footnotes

[1] For example: 'Take 5', MSHA's 'SLAM', etc. See the NMA Risk Management White Paper for more information.

[2] For example: Job hazard analysis (JHA, aka, job safety analysis), standard operating procedures (SOP), etc. See the NMA Risk Management White Paper for more details.

[3] For example: Preliminary Hazard Analysis (PHA), Process Hazard Analysis (PHA) Failure Modes, Effects and Analysis (FMEA), Fault Tree Analysis (FTA), Logic Tree Analysis (LTA), Hazard and Operability Studies (HAZOPS), Bow Tie Analysis (Bow Tie), Layers of Protection Analysis (LOPA), among others.

[4] Hot work in proximity to flammables/combustibles, confined space entry, high voltage electrical work, lifting and rigging, energy isolation, working at heights, surface trenching, handling explosives and shot-firing, simultaneous operations, mobile equipment operation, mobile equipment maintenance, haulage design, ground control, methane-rich environments, mining in seismically-unstable areas, etc.

Fatality Prevention / Risk Management

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

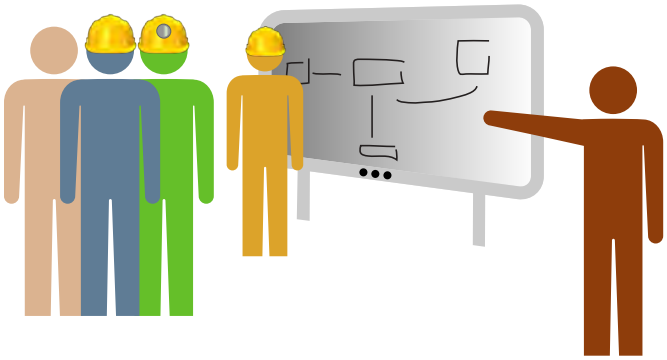
To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module4

Notes

Training and Competence



This module includes:

- Assessing training needs based on level, knowledge and skills required for each task.
- Ensuring workers know how to do their jobs.
- Ensuring workers know the hazards and risks of their assigned tasks.
- Verifying worker competency through demonstrations.

Education (knowledge) and training (knowing how to apply knowledge) are essential to an effective safety and health management system (SHMS). Workers who know how to do their job, understand the hazards and risks of their assigned tasks and apply their knowledge and skills are far less likely to be injured or become ill from occupational disease.

Making it Work

Verification: Being educated or undergoing training is not sufficient. What is more important is how well the worker is able to apply knowledge and skill—whether they are competent. Safety and health excellence requires more than just offering mandated or discretionary training; it requires verification that those trained are competent by demonstrating the acquired knowledge and skills.

Training Needs Assessment: The process begins with a training needs assessment to determine the level of knowledge and skill that will be learned, how frequently training should be conducted and the initial and ongoing requirements to establish competency.

Quality of Instruction: Training that is based on adult learning methods (hands-on versus memorization) tend to be more effective. Regardless of the quality of the training materials, the quality of the learning is most significantly influenced by the quality of the instruction. As such, train-the-trainer development is very useful.

Expectations:

5.1 Conduct training needs assessment for all jobs. Training programs should define the skill level to be acquired and demonstrated, frequency and requirements for competency.

Training and Competence

5.2 All new or transferred employees, visitors, contractors and vendors receive site-based safety and health orientation before being permitted to work onsite.

5.3 Initial, ongoing and periodic refresher training is conducted to ensure job and regulatory requirements.

5.4 Combine discretionary training with regulatory training (MSHA, OSHA) whenever possible, e.g., new employee/miner training with company orientation.

5.5 Where on-the-job training is conducted, the instructor should follow standards for knowledge transfer and adhere to standard operating procedure where they exist.

5.6 Ensure contractors, visitors and vendors receive appropriate training to provide adequate worker protection for both the company and their third-party partners.

5.7 Provide train-the-trainer development to those who develop and deliver company S&H management training.

5.8 Integrate this expectation with all other modules containing training requirements: Modules 3, 4, 7, 8, 9, 10, 12 and 19

Training and Competence

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

1 Percentage of the workforce with current regulatory and discretionary training.

2 Percentage of the workforce judged to be “competent” for their job.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module5

Notes

Emergency Management

Planning for and responding appropriately to emergency and crisis situations through emergency prevention and action plans that include:

- Resource allocation.
- Training.
- Emergency response communications and coordination.
- Recovery.

An effective safety and health management system is designed to prevent incidents from occurring. However, until companies achieve consistent zero incident performance, and in light of the potential for uncontrollable factors such as earthquakes or heart attacks, a well-designed, trained and tested emergency management system is necessary.

Good management plans can prevent a worsening of an emergency and, by protecting responders, can prevent additional incidents from occurring. Companies must have the capability to respond appropriately to emergency and crisis situations.

Emergency management includes:

- **Emergency prevention—**What do we need to do to prevent a non-emergency from becoming an emergency?
- **Planning—**What can go wrong, both expected and unexpected, and how should we respond?
- **Emergency resources—**What materials, equipment, information and people do we need to deal with the emergency?
- **Training—**Who needs to do what when an emergency occurs?
- **Coordination and communication—**What government agencies and non-governmental stakeholders need to be involved and how do we coordinate to manage the emergency with key groups?
    - **Media—**Where will the media be staged and how will updates/briefings be provided?

  - **Families—**How will families' privacy be ensured and their needs met, and how will families be segregated from facilities provided for the media? How will communication be conducted with the families?

- **Recovery—**Once the real emergency is addressed, how do we recover?

These plans should consider potential impacts to the workforce, the public, the environment and company assets.

Expectations

6.1 Develop and maintain written, site-specific emergency response plans. Plans should be based on a critical assessment of potential emergency scenarios and their impacts. [1]

6.2 Ensure plans are communicated, trained and drilled against at an appropriate interval. All potentially affected personnel should be aware of the role and responsibilities in an emergency.

6.3 Plans should include an assessment and acquisition of adequate foreseeable emergency resources, e.g., warning devices, first aid supplies, rescue equipment and communication aids.

6.4 Plans should be communicated to external stakeholders as appropriate.

6.5 Emergency response drills should be conducted with sufficient frequency and intent to assure confidence in the event of a real emergency.

6.6 Maintain adequate internal/external first responder capabilities in relation to operations' size, risk and isolation.

Footnote

[1] Both internal and external impacts should be considered.

Emergency Management

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

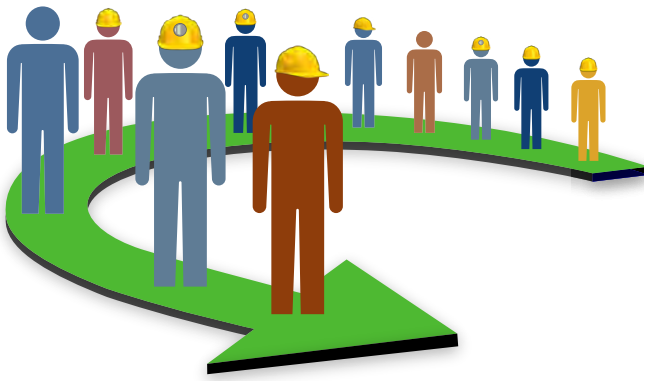
To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module6

Notes

Culture Enhancement



This module includes:

- Identifying desired safety culture characteristics.
- Assessing strengths and weaknesses.
- Developing and implementing a culture improvement plan.

No safety system will be effective without a complimentary safety and organizational culture. Whether the culture is strong and positive depends on the degree to which management understands current characteristics, has a clear idea of what the future culture should look like—based on vision, values and strategy—and has a process to actively enhance the culture. Culture change takes planning, broad involvement and patience. It doesn't occur quickly.

Culture can be measured and managed, and small changes in culture can have a long-lasting effect on safety and health performance.

Measuring and Assessing Culture

Culture is measured and assessed through a confidential employee perception survey and employee interviews, where appropriate. Companies may elect to conduct their own cultural assessment, use the **CORE**Safety assessment tool or work with an external expert. The latter approach ensures confidentiality and optimal data analysis. Once strengths and weaknesses are identified through the assessment process, a culture enhancement plan can be developed and implemented.

Key indicators of positive, supportive cultures include:

- Trust among managers and workers and between workers and managers
- Fair and equitable treatment of employees
- Comfort about reporting incidents and a strong interest in understanding what caused the incident
- A constant state of vigilance regarding hazards and risk (no complacency)

- A pervasive sense of personal and group safety and health responsibility and consistent accountability to match
- Safety and health as common organizational values
- Consistently empowered workers who are confident regarding management's safety and health approach

Culture is driven through leadership and cascades through the entire organization. As a result, the attitudes, actions, behavior and communication of managers have the greatest impact on safety culture, but not to the exclusion of workers who sustain the culture.

Expectations

7.1 Identify the desired safety culture characteristics for your company (to achieve 0:50:5) or adopt those recommended by **CORE**Safety.

7.2 Conduct a confidential employee survey to assess perceptions of the company's safety culture, e.g., strengths and weaknesses.

7.3 Develop a culture improvement plan using tools available on the **CORE**Safety website, or from other sources, based on the survey results.

7.4 Verify culture improvement by re-conducting the confidential culture perception survey at another appropriate interval, e.g., within 18 months of the first survey.

7.5 Repeat the process as necessary to ensure continuous improvement in safety culture perception.

Culture Enhancement

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

To be determined

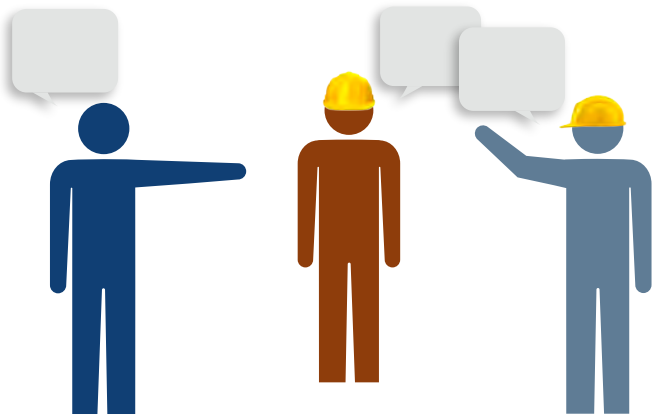
Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module7

Culture Enhancement

Notes

Collaboration and Communication



This module includes:

- Fostering effective two-way communication and involvement among all employees in safety and health decision making and problem solving.
- Ensuring that all relevant safety and health information is shared through open, transparent and frequent communications.

Safety lives in conversation. The more people talk it, the more safety performance improves. Without effective communication, outcomes and success result from chance and luck. While luck is good, no operation should rely on luck to manage critical functions. This is true for safety and health management. One of the most important forms of communication is collaboration involving managers, miners, other workers and stakeholders in the safety decision-making and problem-solving process.

Whether discussing standard operating procedures, how to minimize risk in a non-routine task, reinforcing safe behavior among two co-workers or participating in a safety meeting, communication is critical and should be managed accordingly.

Making it Work

Two-way communication increases involvement and participation in the safety and health management processes. The goal is to have the highest percentage of any operation's workforce involved in the safety and health management processes. Decision making and problem solving for safety and health should not be the exclusive right or responsibility of management.

Consultation within the workforce is one of the best ways to promote feedback regarding safety and health activities and to gain buy-in. All company employees, regardless of their title or function, should be involved in safety and health management by carrying out their designated responsibilities.

In all cases, communication should be open, transparent, mutual and as frequent as possible. Leaders should seek out every opportunity to communicate their vision and personal commitment to safety and health, as well as the appropriate way to work to achieve the 0:50:5 goal.

Collaboration and Communication

Expectations

8.1 Develop an ongoing communication process so all employees, contractors and other stakeholders receive critical safety and health information and can provide feedback when desired. [1]

8.2 Actively manage the visual component of the communication process (signs, posters, instructions, etc.) to ensure effectiveness and message freshness.

8.3 Develop a process to address safety and health suggestions, concerns and complaints in a manner that protects the source from discrimination.

8.4 Consult employees regarding implementation and improvement of the SHMS. Involve them in safety and health problem solving and management to the greatest extent practical.

8.5 Develop an ongoing process to optimize the percentage of employees involved in proactive management activities that drive safety and health performance improvement. [2]

8.6 Establish safety and health committees or teams at all appropriate levels. The team should have management and worker representatives, be trained and focus on personal involvement.

8.7 Develop a repository for safety and health management data and other information to use for analysis and internal communication.

Footnote

[1] For example: incident investigation lessons learned, S&H performance metrics, change in company S&H policyand procedure, risk management outcomes, change management outcomes, etc.

[2] For example: hazard identification, risk assessment, selection and maintenance of controls, incident investigation, S&H training, housekeeping, development of SOPs, etc.

Collaboration and Communication

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module8

Notes

Reinforcement and Recognition

This module includes:

- Using formal and informal positive feedback and rewards.
- Recognizing and reinforcing behaviors and actions that contribute to good health and safety performance.

People are more effectively motivated by positive reinforcement than with negative consequences. Positive reinforcement can be formal (reward, symbolic recognition, public recognition, etc.), but is often most effective when leaders see people doing things right.

Using Reinforcement and Recognition

Reinforcement and recognition that is delivered in a positive manner, soon after and on a consistent basis relative to desired behaviors, is most reinforcing. Comments and actions delivered in a negative, delayed and uncertain manner are much less likely to motivate workers to pursue the desired behavior. This does not mean reprimands aren't important. Rules and procedural violations must be assessed by management and addressed in an appropriate, consistent manner.

A simple verbal or written thank you for doing what is right reinforces safe behaviors, improves attitudes and personal value. When positive reinforcement is genuine it also reflects positively on the leader. Positive reinforcement helps create engaged workers (those aligned with the company's values and mission) and not just motivated workers (those who work hard to achieve personal gain through the company). The use of monetary reward should be limited to avoid developing unhealthy entitlements.

Reinforcement and Recognition

Expectations

9.1 Establish a formal process to reinforce and recognize employee safety and health performance, involvement in proactive activities, and reinforcing safe behaviors, etc.

9.2 Establish an informal, but ongoing, process that encourages all managers/leaders to conduct one-on-one interactions to build relationships and provide positive reinforcement.

9.3 Link reinforcement and recognition to behavior optimization.

Reinforcement and Recognition

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module9

Reinforcement and Recognition

Notes

Resources and Planning

Managing and aligning human resource activities to achieve the 0:50:5 objective through:

- Hiring standards.
- Conditions of employment.
- Employee assimilation.
- Collective bargaining agreements.
- Succession planning.
- Corrective discipline policy.

Individual performance is critical to achieving 0:50:5. That makes close alignment and mutual support between line management, human resources and safety and health professionals vital to success.

What is Needed

The selection, training and management of personnel are critical to achieving safety excellence, as companies depend on the behavior of individuals working within management-controlled environments and processes.

Recruiting workers with a strong personal safety value, ensuring they are free from the negative influence of drugs and alcohol (D&A), mentally and physically prepared to work, and ready and willing to work in compliance with your company's rules and procedures will greatly increase the potential for companies to achieve 0:50:5. These human resource-related activities should be actively and consistently managed to be effective.

Expectations

10.1 Develop hiring standards that describe the physical demands and of each job and verify candidates can perform the work before hiring.

10.2 Utilize behavior-based questions in the hiring process to highlight personal safety and health values and improve judgment regarding candidates' alignment with company values.

10.3 Formally establish working safely as a condition of employment and define the consequences of failing to do so.

10.4 Require job candidates to submit to a pre-employment physicals to ensure they are physically able to perform the described job and identify any pre-existing accommodations.

10.5 Ensure alignment between collective bargaining agreements and safety and health policies, as appropriate, e.g., safe work as a condition of employment, D&A testing, health monitoring, etc.

10.6 Develop a company-specific D&A policy and testing procedure to minimize the potential for negative consequences on safety and health performance. [1]

10.7 Integrate safety and health standards into succession planning.

10.8 Develop an employee assimilation process to ensure the safe and healthy integration of new employees into the work environment.

Footnote

[1] D&A testing policy and procedure must comply with state law and regulation. In lieu of an internal program, this can be accomplished through membership in a multiple company testing mutual.

Resources and Planning

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

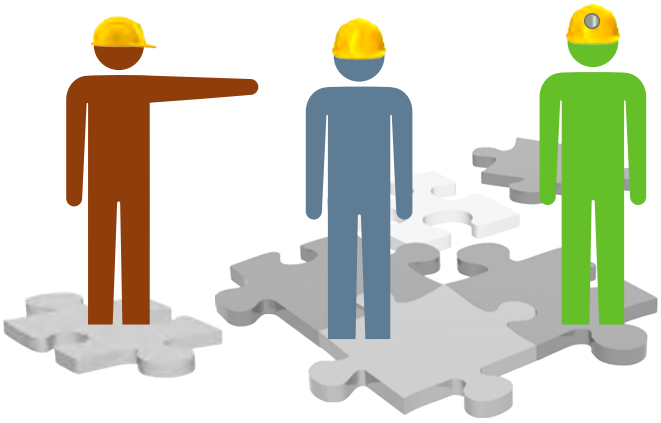
To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module10

Notes

Change Management



This module includes:

- Identifying changes in the organization and at the operation that may introduce new risk or increase unacceptable risk by proactively looking for and controlling change at every level of the organization and across functional areas, including emergency management.

Changes that occur in the operation or related facilities should not introduce new hazards, negatively change the risk rating of existing hazards or degrade controls. This is accomplished through a process called "change management."

Once hazards are identified, risks assessed and prioritized, and controls implemented, management—coordinating with its workforce—systematically looks for and controls change that can increase unacceptable risk. Change that results in unacceptable risk should be managed in the same manner as any other unacceptable hazard/risk, through appropriate and effective controls.

Who and What Change is Included

Fundamental to effective change management is training to ensure all affected personnel have a clear understanding of what "change" requires inclusion in the management process. The change management process should apply to every functional area and every level of the organization.

It should include changes that are:

- Planned or unplanned
- Temporary
- Incremental or permanent

And affect the operation's plan and/or the facilities and its:

- Processes
- Systems
- Procedures
- Equipment
- Products
- Material
- Organization
- Personnel

Managing Emergencies

The change management procedure should include a provision to address emergencies where the full management of change is likely to be unrealistic. As such, management of change and emergency management should be closely coordinated, with the goal of ensuring emergency procedures exercised in response to a crisis or emergency do not introduce additional and unacceptable risk.

Expectations

11.1 Define change requiring management review. Communicate this process to all affected employees, contractors and other stakeholders. [1]

11.2 Develop a change management procedure that defines the "who, what, when and how" for the reviews. Define who is authorized to approve change actions.

11.3 Ensure that the procedure includes provisions to verify that change management actions have been completed and that they do not significantly result in new, negative risk.

11.4 Integrate change management actions into the safety and health communication process to ensure all potentially affected parties are knowledgeable. [2]

11.5 Document change management decisions for tracking and verification purposes and for future reference.

11.6 Pre-start up safety reviews should be conducted on all new operations, expansions, processing facilities, major mobile and fixed equipment and control systems. [3]

11.7 Ensure that change management is fully integrated with Risk Management and High Risk Procedures (Module 4).

Footnote

[1] For example: potential change events can include processes, equipment, the physical environment, technology, controls, procedures, laws, regulations, systems, personnel, organization, etc. Change representing a replacement in kind should be viewed as a minimal change subject to quality of construction considerations.

[2] See Module 1, Expectation 1.4.

[3] Pre-start up safety review is led by management and includes technical staff, operators and S&H professionals, as available, to confirm that construction conforms to design, verification testing is complete and acceptable, and operational, maintenance and emergency provisions are understood by relevant personnel.

Change Management

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module11

Notes

Work Procedures and Permits

Integrating safety and health into operations and maintenance by:

- Organizing and conducting work in a predictable manner.
- Specifying ways to carry out an activity or process.
- Using more controlled procedures for those activities or processes that are high risk or require a permit.

The two main elements of this module are safe work procedures and permits to work.

Safe work procedures are a specified way to carry out an activity or a work process. Safe work procedures should be written and may include video-based instructions that outline the steps necessary to complete routine and some non-routine work tasks in a safe manner. They are generated from risk assessment processes such as systematic job and task SJT. (See Module 4 Fatality Prevention / Risk Management.) The keys to making work procedures effective are:

- Use workers who do the work to assist in procedure development
- Use the procedures for training, particularly for on-the-job training
- Ensure front line supervisors and/or managers audit work against the procedures

Permits to work offer a more controlled procedure for tasks that are either high risk or mandated by regulation to require a permit.

Misuse or avoidance of safe work procedures and permits should be addressed through corrective discipline. Conversely, adherence to safe work procedures and permits should be recognized with positive reinforcement.

The Role of Line and Senior Management

Because line and senior management have the greatest ability and resources to prevent incidents, companies with world class safety and health performance often say "safety is a line function." Line and senior management supervise and manage workers who are generally at greatest risk; they have the largest impact over equipment and the facility environments, and they control the resources necessary to make the safety and health management systems (SHMS) work.

One of the most effective points of focus for line management in the **CORE**Safety SHMS is the integration of safety and health into operations and maintenance activities. Achieving the 0:50:5 goal means work tasks are conducted in an organized and predictable manner. And when they are not predictable, as with non-routine work, there should be procedures to assess the risk and procedures to make the work task as controlled and predictable as possible.

If the safe outcome of the task is uncertain, it should not be attempted until there is certainty.

Examples include, but are not limited to: hot work, confined space entry, high voltage electrical work, lifting and rigging, energy isolation, surface trenching, handling explosives and shot-firing, mobile equipment operation, mobile equipment maintenance, ground control, methane-rich environments, mining in seismically-unstable areas, among others.

Expectations

12.1 Standard operating procedures (SOPs) are developed for routine and repeated non-routine work based on work procedures and outcomes of systematic job and task (SJT) analyses.

12.2 SOPs are used as the basis for on-the-job training and audited against by front line supervisor or managers. Competency verifications are also based on SOPs.

12.2 General and specialized S&H rules should be developed, communicated to all employees and contractors and enforced through a fair and equitable disciplinary policy.

12.3 Risk-specific and/or general work permit programs should cover all high risk work (whether routine or non-routine) and include sign-off authority and operational limitations.

12.4 Protocols (more detailed SOPs) should be developed for high-risk tasks that warrant the highest level of control owing to the difficulty in minimizing risk and high consequences.

12.5 Ensure safe work procedures and permit to work is fully integrated with Module 4.

12.6 Ensure all contractors and vendors are trained on and comply with the work permit and safe work procedure requirements.

Work Procedures and Permits

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

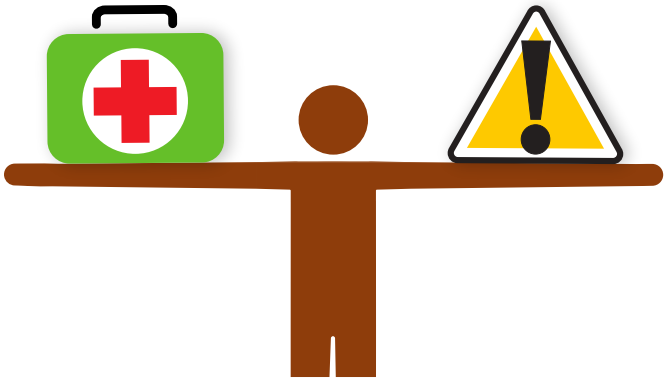
Percentage of job tasks with a documented SOP and/or JHA.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module12

Notes

Occupational Health



Treating health on par with safety by:

- Anticipating, recognizing, evaluating and controlling occupational health hazards leading to illness.
- Applying appropriate new technologies, with an emphasis on exposure assessment and medical surveillance.

Occupation health should be treated on par with worker safety. The only difference between a worker injured on the job and one who is impaired from an occupational disease is that one occurs very rapidly, while the other occurs over a period of many years. Strong performance on occupational health is accomplished by anticipating, recognizing, evaluating and controlling occupational health hazards leading to illness.

Making it Work

Companies should conduct periodic exposure assessment when employees face potential overexposure to hazards (noise, dust, welding fumes, radiation, chemicals, etc.), or when deemed appropriate by a professional industrial hygienist.

An exposure assessment program includes two factors:

- Compliance with regulatory requirements for exposure monitoring; and
- Determinations on the need for exposure controls and follow-up medical monitoring to guard against lasting effects from the exposure(s).

Exposure assessment should follow validated sampling methodologies and accepted industrial hygiene practices. New technology, such as Personal Dust monitors (PDM), should be applied to serve as a mechanism to modify employee behavior relative to exposure to airborne contaminants.

Occupational Health

Expectations

13.1 Conduct representative qualitative and quantitative risk (exposure) assessments to characterize occupational health hazards and associated risks. [1]

13.2 Determine the degree of control necessary to address occupational health hazards and apply ”hierarchy of control” accordingly.

13.3 Ensure exposure assessment results are communicated to affected employees in a timely and understandable way.

13.4 For “over exposures,” determine the need for temporary or permanent health monitoring and conduct monitoring using appropriate medical standards. [2]

13.5 Ensure accurate protection of employee medical confidentiality for non-occupational information, e.g., HIPPA.

13.6 Provide a mechanism to assess employee general health risks that are relevant to the occupational setting, e.g., blood pressure, blood sugar, weight, flexibility, strength, etc.

13.7 Provide wellness education for employees including mechanisms that can be pursued to improve general health risk factors both on and off the job.

13.8 Document occupational health management data for compliance, analysis and verification purposes and for future reference. [3]

Footnotes

[1] Hazards may include, but are not limited to: dust, welding fumes and other metallic particulates, noise, acid mists, organic vapors and solvents, ionizing and non-ionizing radiation, diesel particulates, toxic gases, asbestos soluble oil, synthetic mineral fibers, microbiological agents in mold, heat stress, illumination, ergonomic stressors, etc.

[2] Audiometric testing, pulmonary function testing (PFT), chest x-rays, dermatitis skin testing, blood or urine metal testing (biological exposure indices), etc.

[3] Documentation should be maintained through a documentation retention plan.

Occupational Health

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

1 Percentage of jobs with exposure assessment data.

2 Percentage of workforce with exposure above 50 percent of an occupational exposure limit (OEL).

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module13

Notes

Incident Reporting and Investigation

This module includes:

- Understanding and reporting of recordable/reportable incidents.
- Investigating all incidents, including relevant near misses, to establish root cause, as appropriate.
- Capturing lessons learned/root cause data for management review and communication to employees.

Integrity in reporting and timely investigation are critical steps for the prevention of future occurrences. Laws and regulations result in two incident categories that mandate different types of reporting:

Incidents reportable to regulatory authorities: All safety and health incident investigations that are mandated to be reported should be promptly examined to identify means to prevent reoccurrence and communicated to the respective regulatory authorities.

Incidents that are non-reportable to regulatory authorities: Non-reportable safety and health incidents should also be investigated, analyzed and corrective actions developed and integrated into the safety and health management system. Such incidents include:

- Near miss events
- Property damage
- Operational, maintenance or process integrity incidents that could have a negative outcome

The Role of Reporting and Investigations

Incidents cannot be investigated if they are not reported.

All personnel should be aware of what a reportable incident is within each company and as defined by regulatory requirements and company policy. All personnel should also understand the expectation to report an incident to management in a timely manner.

Incident Reporting and Investigation

The quality of any root cause analysis is directly related to the quality of the incident investigation. Companies should ensure personnel are adequately trained to conduct required investigations or maintain close coordination with external resources capable of doing so. Incident investigation should focus on fact-finding—not fault-finding—with incident investigations focusing on root cause.

Expectations

14.1 Ensure all personnel are trained and understand the company's and regulatory authority's definition of a recordable/reportable incident and their obligation to comply.

14.2 Investigate all incidents, including near misses, to a level of detail appropriate to their maximum likely outcome. All full investigations should reach root cause.

14.3 Ensure that a sufficient percentage of company personnel, representing all company functions, are trained in effective incident investigation and root cause analysis.

14.4 Develop or adopt a root cause analysis procedure that is integrated with the structure of the SHMS, i.e., root causes should relate to the SHMS, as a minimum.

14.5 Capture the lessons learned and ensure they are communicated to all personnel with a need to know.

14.6 Compile root cause data and forward to management for their review of the SHMS (See Module 19 Engineering and Construction).

Incident Reporting and Investigation

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

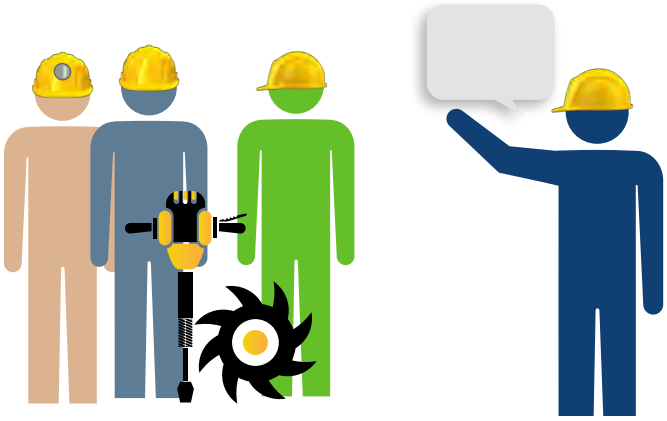
Percentage of recordable/reportable incidents (and high potential near misses) that undergo incident investigation and root cause analysis.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module14

Notes

Behavior Optimization



Minimizing unsafe behavior by:

- Educating all employees on the causes of safe and unsafe behavior.
- Developing an observation and feedback process.
- Emphasizing how to control behavior and intervene with co-workers.[∞]

Unsafe behaviors are a key contributing factor in many mining incidents. However, behavior is a consequence and not a cause. We now know attitudes and behaviors are both measurable and manageable.

It is important to optimize behavior because carefully designed and effectively implemented work procedures that are not complied with still have substantial potential for increased injury and incidents.

What We Know about Behavior

Most experts believe human behavior (anything that is an observable action) is primarily controlled by the "ABC model" of **A**ctivator—**B**ehavior—**C**onsequence.

Activators: People behave the way they do because they are *activated* to do so. Activators can be someone's voice, a phone ringing, a written to do list, memory, training, etc. Activators can be either conscious or subconscious.

Behavior is a reflection of our knowledge, training and competence and can be intentional or unintentional. Individuals are most often motivated to repeat a behavior, e.g., driving within the speed limits, by the **consequences** or enforcements experienced from previous behaviors.

Behaviors are also affected by people's attitudes about risk. This knowledge helps us to minimize unsafe behavior by making workers aware of why they behave the way they do, what is a safe and unsafe behavior, and what can be done to minimize unsafe and encourage safe behaviors.

15 Behavior Optimization

Expectations

15.1 Educate employees regarding the causes of safe and unsafe behavior, e.g., the ABC model, how to control their own behavior and when and how to intervene with co-workers.

15.2 Develop a workplace observation and feedback process. The process should be confidential and voluntary, but collect observation data for analysis. [1]

15.3 Apply the ABC model beyond observation and feedback to include an emphasis on general safety and health activators and consequences.

15.4 Integrate behavior optimization with related SHMS Modules: 12 (Work Procedures), 14 (Incident Reporting), 8 (Collaboration and Communication), 7 (Culture Enhancement), etc.

15.5 Ensure adequate focus on the quality of observations and feedback.

Footnote

[1] Should include all personnel and address all activities. Should include the development of a critical behavior inventory, should be managed by employees and facilitated by management, and should include both behaviors and work processes.

Behavior Optimization

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

1 Percentage of personnel participating in observation and feedback.

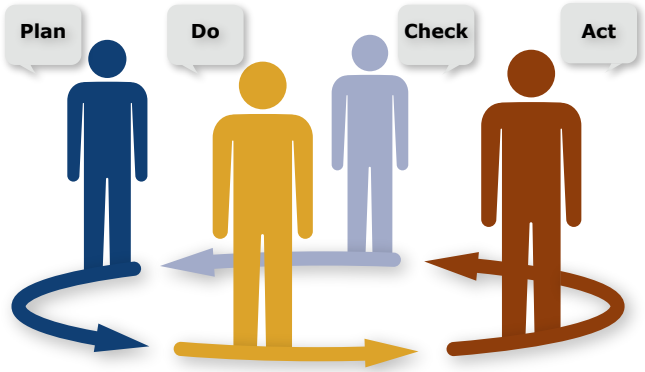
2 Percentage safe and unsafe behaviors within the workforce.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module15

Notes

Safety and Health Management Assurance



This module includes:

- Establishing a procedure to assess compliance with applicable legal requirements.
- Maintaining current information.
- Developing an improvement cycle that is integrated with the company's safety and health management system.

Operations should be in full compliance with statutory and regulatory requirements to ensure value-added regulations are leveraged. This can be best accomplished by integrating an improvement cycle with the company's safety and health management system and applying the **Plan-Do-Check-Act** process to each regulation. Each requirement should have someone responsible for ensuring the requirements have been met and are working as designed on an ongoing basis. This feedback is essential for consistent compliance.

Expectations

16.1 Establish a procedure to assess compliance with applicable legal [1] and other S&H management requirements and keep this information current.

16.2 Compliance with regulations should be managed through the Plan-Do-Check-Act improvement cycle and should be integrated with the company SHMS.

Footnotes

[1] Federal, state and local legislative and/or regulatory requirements.

16 Safety and Health Management Assurance

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

1. Percentage compliance with 30 CFR.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module16

Notes

Assurance

This module includes:

- Implementing a process to assure internal and external stakeholders of the adequate structure, fitness and effectiveness of the safety and health management system.
- Ensuring management is using assurance information to determine how to improve the safety and health management system.
- Providing for corrective action and continual improvement based on senior management direction.

It is necessary to periodically assess implementation of and conformance with the expectations of the safety and health management system (SHMS) to assure an adequate structure exists to analyze the fitness and effectiveness of the SHMS. This process should be managed by senior management and may involve both internal and external audits and assessments. Where nonconformance is identified, corrective action should be taken to ensure continual improvement in both SHMS effectiveness and the resulting safety and health performance.

Expectations

17.1 Develop a process to measure system and S&H management performance through the use of lagging and leading indicators.

17.2 Ensure senior management participates in the performance assurance process to optimize transparency and ensure there are adequate resources to facilitate system improvement.

17.3 Non-conformance against the SHMS should be addressed with appropriate actions to correct the non-conformance.

17.4 Internal audits should be scheduled in advance and conducted by personnel with adequate experience and knowledge of SHMS audit methods and processes.

17.5 Routine audits (and periodic external audits) should be conducted by a competent third party at an interval sufficient to ensure continuous improvement.

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Assurance

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ☐ Yes ✓ No

Metrics

1 Percentage implementation of the SHMS.

2 Percentage of review actions that are implemented on time.

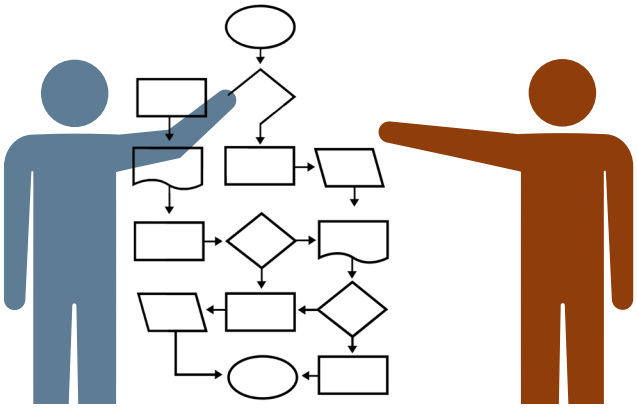
Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module17

Assurance

Notes

Documentation and Information Management



This module includes:

- Collecting appropriate safety and health data for leading and lagging performance metrics.
- Establishing and maintaining appropriate safety and health management records.

Companies should establish and maintain appropriate safety and health management records as designated by senior management that include, among others:

- Safety and health policy
- Objectives
- Responsibilities
- Audit investigations
- Management reviews

The type and volume of records should reflect the size, complexity and risks of the organization. The safety and health management systems should identify those documents that require retention and maintenance.

Documentation should be developed carefully so as not to deflect resources from proactive safety and health management activities.

Expectations

18.1 Develop a documentation retention process that balances need to retain with the need to perform and improve.

18.2 Ensure records are legible and identifiable and linked to the activities from which they derive. They should be readily retrievable and physically protected.

18 Documentation and Information Management

18.3 Retain documents based on regulatory requirements as well as company document retention policy, as appropriate.

18.4 Determine performance trends by looking for common or significant events and patterns in root causes, inspection records, audit action items, behavior observations, etc.

18 Documentation and Information Management

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module18

Documentation and Information Management

Notes

Engineering and Construction

This module includes:

- Designing, procuring, constructing and commissioning new mines, facilities and modifications to existing facilities to promote good safety and health performance throughout the operational life of the facility.
- Integrating the "hierarchy of controls" and good design principles to minimize new mine, facility or modification risk to the lowest level reasonably achievable.

New operations and modifications to existing facilities should be designed, procured, constructed and commissioned to promote good safety and health performance throughout the operational life of the operation, mine and/or processing facility by applying recognized engineering standards, procedures and management systems.

Facilities should be operated and maintained within the approved design to ensure performance and compliance with all applicable laws and regulations. This also means ensuring the technical standards for design, construction and commissioning adhere to industry codes and standards and regulatory requirements.

Safety and health management requirements should be incorporated as a part of all relevant design reviews for construction, operation and maintenance for new fixed installations, mobile equipment and systems.

Where feasible, companies should work with original equipment manufacturers (OEM) to ensure purchased equipment and systems are designed to be as safe as practicable. Engineers and designers should be aware of the company's safety and health expectations, standards and management system in advance of completing design or engineering work.

Expectations

19.1 Safety and health management, operations and maintenance expertise are integrated into project planning processes from the inception.

19.2 Where engineering and design codes and standards and/or regulatory compliance are inadequate or absent, management should develop its own with external validation. [1]

Engineering and Construction

19.3 Design and construction for any project with safety and health management considerations should target regulatory as the minimal allowable risk.

19.4 Deviations from standard and accepted design are reviewed and approved by senior management. Variances are documented with adequate justification details.

19.5 The S&H management aspects of construction work conducted on company property should conform to the company's SHMS standards and expectations.

19.6 Pre-start up safety review should be conducted on all new operations, mines, processing facilities, major mobile and fixed equipment, and control systems. See Module 4 for details.

19.7 Ensure that Engineering and Construction are fully integrated with Module 4 and 20.

Footnote

[1] Using external professional engineers to validate the engineering specifications and design.

Engineering and Construction

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

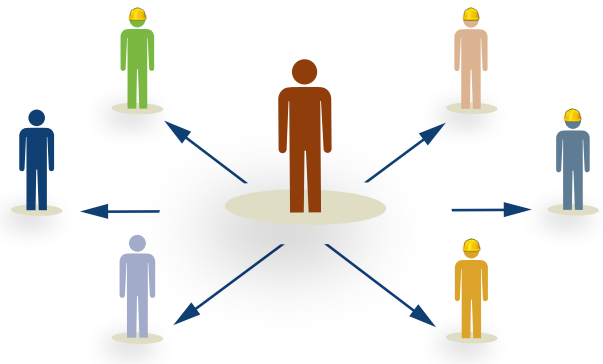
To be determined

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module19

Notes

Contractor Management and Purchasing



This module includes:

- Ensuring all company-sponsored project proposals include safety and health management criteria or requirements.
- Pre-screening contractors for acceptable safety and health management experience, qualifications and procedures.
- Ensuring all contractors and third parties are aware of your organization's safety and health management requirements and expectations

Contractors play a significant role in safety and health management at facilities whether there are contract miners or contractors performing project work. They often face very similar, if not more significant, risk than do company employees. If contractors do not receive the appropriate instruction and direction to work safely, they can introduce new hazards to the workplace that put themselves and company workers at risk.

Factors to Success

Selection and bidding: Contractor selection should be conducted using a screening process to ensure adequate safety and health management competencies and experience. Contractors should know the company's safety and health management requirements in the bidding process.

Orientation and training: Once selected, contractors, vendors and visitors should be provided adequate orientation and any ancillary training necessary to understand site rules, safe work and emergency procedures, communication protocols or other site requirements.

Enforcement: Company employees should be authorized to question the safety practices and behaviors of any contractor or other third party working on site.

Procurement policy: In addition, companies should develop a safe procurement policy in which purchases of fixed or mobile equipment include coordination with the vendor to ensure the equipment comes engineered with all necessary safety features and controls, e.g., noise control on stationary motors and pumps, maintenance access points on mobile equipment, diesel exhaust controls, etc.

Contractor Management and Purchasing

Expectations

20.1 Ensure all company-sponsored project proposals and/or requests for proposals include safety and health management criteria or requirements.

20.2 Pre-screen all operational and project contractors for acceptable S&H management experience and qualifications.

20.3 Ensure contractors notify the company of the introduction of tools, equipment, materials, chemicals or work processes that could be a risk to contractors and/or company personnel.

20.4 Ensure all contractors and third parties are aware of S&H management requirements and expectations including emergency response plans and reporting obligations.

20.5 Integrate a safe procurement process into the company's risk management function, e.g., Module 4 Fatality Prevention / Risk Management.

Contractor Management and Purchasing

Regulation

Partial or full MSHA and/or OSHA regulatory requirement: ✓ Yes ☐ No

Metrics

1 Percentage implementation of the SHMS.

Resources

CORESafety resources can be found with the latest updates at:
coresafety.org/resources/module20

Notes