

# Safety & Health Management Systems: Utilization for Mine Safety

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# Overview

- OSHA and MSHA are engaged in rulemaking to establish mandates for safety & health management systems (SHMS or “I2P2”)
- MSHA has also indicated SHMS may be required to demonstrate “mitigating circumstances” to avoid Pattern of Violations findings
- 34 states – including many OSHA State Plan States - have mandated or recommended adoption of SHMS
  - Programs usually apply to all employers, regardless of size
- CalOSHA I2P2 programs are required at mines in California as the agency has dual jurisdiction with MSHA
- ANSI Z10, *Occupational Safety and Health Management Systems*, was released in 2005, and encourages employers to reduce the risks of injuries, illnesses, and fatalities in a cost effective manner.
- Z10 and OSHA’s SHM program guidelines serve as a blueprint for widespread benefits in health and safety as well as in productivity, financial performance, quality, and other organizational and business objectives.

# ANSI Z10 Overview

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- This standard is non-mandatory, but could eventually be incorporated by OSHA and/or MSHA in a S&H Program Management Standard.
  - OMB Circular A-119 mandates use of consensus standards, where feasible, when federal agency embarks on new rulemaking.
- Helps employers meet the intent of OSHA's General Duty Clause (Sec. 5(a)(1) of OSH Act) to provide a workplace that is “free from recognized hazards that are causing or likely to cause death or serious physical harm.”

# SHMS Basic Elements

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- The five basic elements are:
  - Management leadership and employee participation;
  - Planning;
  - Implementation and operation;
  - Evaluation and corrective action; and
  - Management review
  
- Any of these elements may be used by OSHA, state OSHA agencies, MSHA, or other gov' t entities to help support enforcement decisions currently under GDC.

# Management Leadership

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- Occupational/mine safety and health management systems focus on management spearheading safety efforts
- Successful SHMS implementation requires strong leadership and a solid commitment from upper management.
- Management must establish a safety and health policy and communicate the information to all employees (preferably in writing, with dated/documentated receipt).

# Management Leadership

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- The documented policy should have the following components:
  - Protection and continual improvement of employee health and safety;
  - Effective employee participation;
  - Conformance with the organization's health and safety requirements; and
  - Compliance with applicable laws and regulations (federal and state).

# Employee Participation

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- Employees have personal responsibility to comply with all safety and health rules established by management (but don't expect MSHA/OSHA to take sure enforcement action except against agents of management).
- Employees must have opportunity to participate in safety-related planning, and provide input into:
  - implementation,
  - evaluation, and
  - corrective/preventive actions geared toward addressing hazards in the workplace.
- Can be accomplished through use of safety/health committees (some state OSHA laws already mandate these).
  - Be mindful of constraints that may be in CBAs.

# Planning

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- Planning process is a key component in order to systematically prioritize:
  - SHMS issues,
  - establish appropriate objectives, and
  - devise a plan to meet the established objectives.
  
- Proper planning involves:
  - Thoroughly documenting and reviewing all equipment and processes to determine risk factors;
  - Conducting a hazard analysis to identify potential and existing hazards and exposures and to evaluate the frequency employees will be exposed to the hazards, and
  - Identifying the hazard control measures/methods and evaluating the potential severity of the hazard.

# Implementation & Operation - Training

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- The necessary competence in safety & health for each task should be defined, and consider regulatory requirements.
  - More than 100 OSHA and MSHA standards have specific training mandates.
  
- Competency for identification and elimination or control of work-related hazards and risks, and to for implementation of responsibilities under safety & health management system.
  
- Training programs should address:
  - Company policies and procedures;
  - Appropriate PPE;
  - JSA/JHA;
  - Maintenance & housekeeping;
  - Site-specific emergency & security procedures;
  - Worksite evaluation, incident investigation, and audit procedures;
  - Applicable OSHA/MSHA and consensus standards.

# Implementation & Operation

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- This involves applying specific controls and applying risk-reducing methods to implement a strong SHMS. Steps include:
  - Elimination of the hazard,
  - Substitution of a less hazardous material, process, or equipment,
  - Engineering controls,
  - Warnings
  - Administrative controls
  - Personal protective equipment (PPE) – last resort after all eng/adm controls exhausted.

# Evaluation & Corrective Action

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- Regular and frequent evaluations of the program should be conducted by management.
- Audits as well as corrective actions and follow-ups should be documented.
  - Make sure there is management commitment of resources to address promptly any identified deficiencies.
- Audits/evaluations should identify areas not compliant with applicable standards.
  - If audit reveals any OSHA/MSHA non-compliance, condition must be abated immediately.
  - Failure to do so could result in willful or unwarrantable failure citations, because of management knowledge of violation.

# Management Review

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- Annually reviewing applicable agency standards, new policy from OSHA/MSHA, and internal safety programs -- and comparing them to ANSI Z10 or other SHMS -- may help identify and correct weak areas.
- This will improve the way processes and procedures are performed and should decrease the frequency and severity of injuries.
- Management review provides a clear picture of the effectiveness of the SHMS, as well as its impact on the business needs of the organization.
  - Support will be gained for continuing programs if cost savings are included in review process (e.g., worker's comp costs, property damage reduction from industrial accidents, reduction in OSHA/MSHA citation penalties, lower tort exposure from contractor accidents).

# Monitoring & Measurement

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- How do you measure the effectiveness of your program and seek ways to improve it?
- Can you measure your facility against your peers or departments against each other?
- What tools can make metrics easier to manage and simple accident investigations?
- Thorough evaluations will give insight into where to improve the process.

# Monitoring & Measurement

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- Assessing the effectiveness of I2P2 and responding quickly to failings or emerging issues requires vigilance, resources, and metrics beyond reportable incidents.
- Companies must ensure continued worker input, measurable benchmarks, an effective hazard prevention and mitigation method, effective training and worker competency.
- OSHA has demonstrated heightened attention on companies that fail to resolve safety violations identified in OSHA inspections
  - The same approach can be expected for companies that fail to resolve hazards identified through I2P2 or program inadequacies
  - Safety audits may become discoverable documents to demonstrate monitoring of workplace conditions

# Types of Metrics

- *Lagging indicators*: These measures of safety performance come after the fact. For example, to determine how your safety process is doing, you might choose to look at your incidence rate. But without an actual incident, you really have no metric.
  - Is no “incidents” a metric revealing a high level of safety. . . Or was there underreporting? Near-misses? Is it a coincidence?
- Even if the lowered incident rate reflects better safety performance, the rate alone doesn't tell you what worked to improve the rate.
  - Was it increased training? Engineering controls? Employee safety suggestions? New incentive program?
- Don't dismiss the value of lagging metrics. But you also need to look at leading indicators - which keep an incident from ever happening, or that identify problems before they become serious.
- *Leading indicators*: With leading indicators, such as percent of departments conducting self-inspections, number of safety committee meetings, etc., you look at positive activities that occur before and independent of a negative event (accident) ever occurring.
- A variety of indicators may be the best way to evaluate program performance!

# Historical Metrics To Justify I2P2

- Most safety and health organizations perform numerous duties throughout the year - inspections, industrial hygiene surveys, MSDS reviews, indoor air quality assessments, ergonomic studies, fire drills, accident investigation, and so on.
- Effective organizations use this data to their advantage to demonstrate value to the company.
- Examples:
  - Demonstrate that your hearing conservation program has reduced the total population of exposed individuals by ten percent over three years.
  - Demonstrate that you performed 80 more ergonomic surveys, resulting in 92 more corrective actions this year, demonstrating where you spent your resources. Hopefully, your injury statistics validate the efforts.
- Data and metrics are best presented as trends, using comparative data (two or three years) to clearly relate how much has been done or what has been accomplished.
  - If the number or trends are not complimentary, use this as an opportunity to request and justify additional resources.

# I2P2 Program Assessment Metrics

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- One of the most impressive metrics to present continues to be a program assessment result, presented as a score or ranking.
- More and more, companies are evaluating their programs or management system annually.
  - One year's scores are less meaningful, unless used to convey relative strengths and weaknesses.
- Trends, depicting a progression of program or element scores over a period of a few years, can have a powerful effect on management and lend further credibility and justification to proposed initiatives.

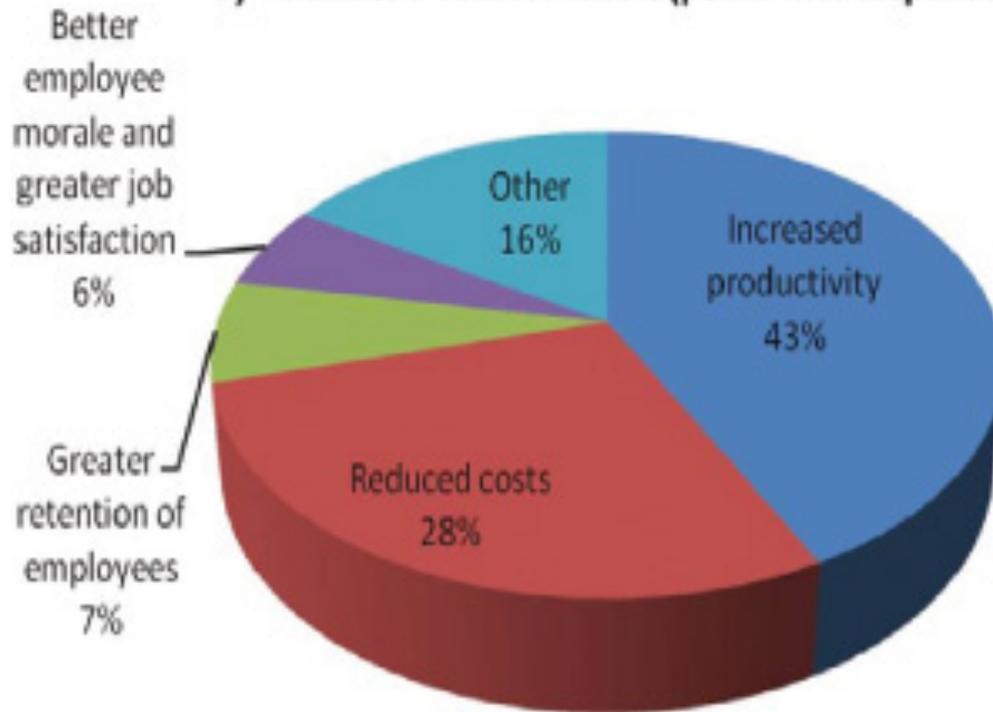
# Cost/Benefit Analysis

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- BLS estimates that approximately 3.3 million serious work-related injuries and about 4,300 fatalities occurred in 2009
- According to the 2010 Liberty Mutual Workplace Safety Index, the direct cost of the most disabling workplace injuries and illnesses in 2008 amounted to \$53.42 billion in U.S. workers compensation costs, more than one billion dollars per week
- When doing cost/benefit analysis, make sure to include:
  - Direct costs including:
    - worker's compensation expenses,
    - insurance premium increases,
    - OSHA/MSHA citations, and
    - trial verdicts in tort litigation.

# Top Benefits of I2P2 Programs

Top Benefits of Effective Workplace Safety Programs Cited by Financial Decisionmakers (percent of respondents)



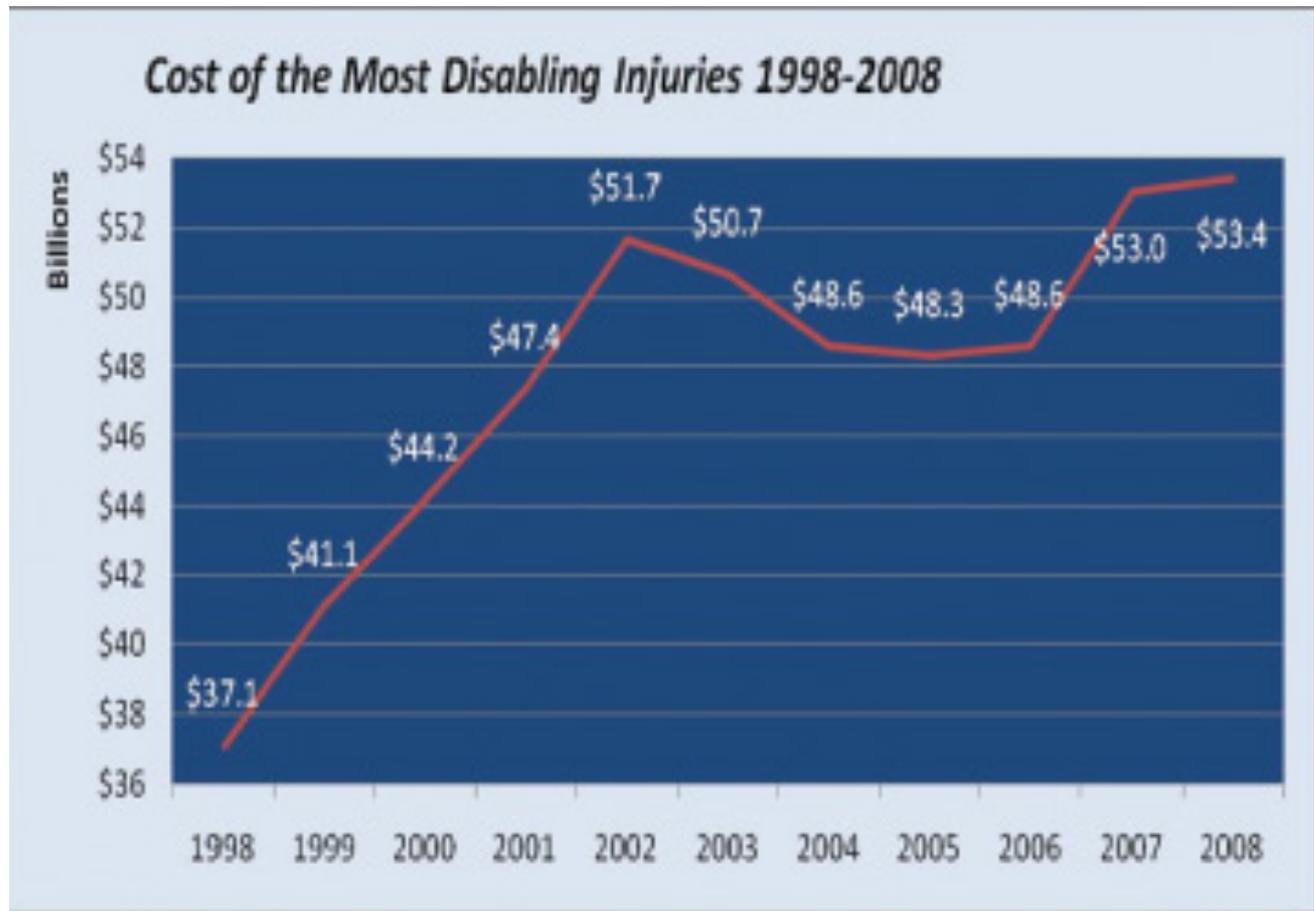
Source: Huang et. al., 2009. Data based on responses from 231 U.S. companies with 100 or more employees.

# Occupational Accidents -- Annual Direct Costs

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Overexertion	— \$12.7 bil.
Fall on same level	— \$6.6 bil.
Fall to lower level	— \$5.0 bil.
Bodily reaction	— \$4.8 bil.
Struck by object	— \$4.4 bil.
Highway incidents	— \$2.3 bil.
Repetitive motion	— \$2.1 bil.
Struck against object	— \$2.0 bil.
Caught in/compressed by	— \$1.9 bil.
Assaults/violent acts	— \$0.4 bil.
“All other”	— \$6 bil.

# Liberty Mutual Data



Source: Liberty Mutual Research Institute, 2010.

# Indirect Costs of Accidents

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- Indirect costs of injuries may be 20 times the direct costs, due to:
  - training and compensating replacement workers;
  - repairing damaged property;
  - accident investigation and implementation of corrective action;
  - scheduling delays and lost productivity;
  - administrative expense; and
  - low employee morale and increased absenteeism.

# Other Hidden Costs

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- Impact on victim's family and co-workers/ witnesses to industrial accidents (PTSD)
- Company gets bad reputation in community – hard to attract good workers
- Problems getting contracts because of track record
- Problems getting permits for new facilities from state/local governmental agencies.

# Motivations For S&H Programs

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- Cost of workers' compensation insurance (59 percent);
- "Right thing to do" (51 percent);
- "Increases Profitability" (33 percent);
- Federal/State safety rules (31 percent);
- "Too many accidents" (29 percent);
- Employee morale (26 percent);
- Productivity (23 percent);
- OSHA/MSHA fines (20 percent);
- Employee concerns (5 percent); and
- Recommendations of outside experts (13 percent)

# State S&H Program Regulations – Washington State OSHA (WISHA)

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## **WAC 296-800-14005**

### ■ **Develop a formal, written accident prevention program**

### ■ **Employers must:**

- Develop a formal accident prevention program that is outlined in writing.
- Have a program tailored to the needs of the particular workplace or operation and to the types of hazards involved.
- Make sure the Accident Prevention Program contains at least the following elements:
  - A safety orientation covering a description of the total safety and health program, on-the-job orientation, how and when to report on-the-job injuries, how to report unsafe conditions and practices, use and care of required PPE, what to do in an emergency, including how to exit the workplace, identification of hazardous gases, chemicals, or materials and instruction on safe use and emergency action after accidental exposure.
  - A safety and health committee ([WAC 296-800-130](#)).

# State S&H Program Regulation – California (CAL-OSHA)

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- As of 1991, a written, effective Injury and Illness Prevention (IIP), Program is required for every California employer.
- ANSI Z10 can help meet requirements, because the mandatory Cal-OSHA IIP must include:
  - Management Commitment
  - Assignment of Responsibilities
  - Safety Communications
  - Hazard Assessment & Control
  - Accident Investigation
  - Safety Planning, Rules & Work Procedures
  - Safety & Health Training

# Getting Started on S&H System

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- (1) Identify a person with authority and responsibility for implementing the program;
- (2) Include a system for ensuring that employees comply with safe and healthy work practices;
- (3) Include a system for communicating with employees on matters relating to occupational safety and health;
- (4) Include procedures for identifying and evaluating work place hazards, including periodic workplace inspections;
- (5) Include procedures to investigate occupational injuries or illnesses;
- (6) Include methods for correction of unsafe or unhealthy conditions in a timely manner; and,
- (7) Provide training in safe and healthy work practices for all employees.

# Safety & Health Programs

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## Critical Elements:

- Specific and measurable goals (besides injury/illness rates) must be established.
- Employee training.
- Comprehensive hazard identification, process safety and risk assessment for all industrial products and processes.
- Human factors analysis before being implemented or utilized in the workplace.
- Monitor and address occupational health hazards (and recognize emerging issues that may not YET be subject to regulation – e.g., ergonomics).
  - If management ignores health hazards on-site, employer may be the target of a class action suit or emergent claims many years later arising from illnesses with long latency period.

# Other Critical Features

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- “Near Miss” incidents must be investigated as seriously as serious accidents, because they reveal workplace’s true hazard potential and common (dangerous) shortcuts that may have become “SOP.”
- Processes that are related to a high number of non-fatal lost-time injuries should be reviewed carefully to see if they need reengineering.
  - If JHA is used, periodically review to ensure they are still applicable to current processes and equipment.

# Contractor Safety Issues

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- Programs must be in place to ensure that independent contractors perform safely.
  - Contractors can be weakest link and communication of risks that contractors create, or to which they may be exposed is essential.
  - S&H management system should include method of prequalifying contractors, vetting their programs and training, before bid is awarded.
  - Under OSHA/MSHA policies (and case law), host employer can be held responsible for contractor violations if they have actual or constructive knowledge – even if host employer has no exposed employees (See *Summit Construction*, *Twentymile Coal* cases).

# Contractor Safety Issues

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- Mandatory standards requiring harmonization of safety efforts include, but are not limited to:
  - Hazard communication
  - Confined space entry
  - Lockout/tagout (electrical & mechanical work)
  - Process safety management
  - Asbestos removal
  - Hazardous waste (HAZWOPER)
  - Emergency response activities.

# Upper Management's Role

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- Commit adequate resources to maintaining and improving S&H systems and performance;
- Assist supervisors in conducting workplace hazard assessments to identify, evaluate, and correct hazards;
- Provide training and technical assistance to managers and supervisors on system implementation;
- Review, update and evaluate the overall effectiveness of the program; and,
- Evaluate the adequacy and consistency of training designed by departments and/or third party consultants.
  - SHMS place significant emphasis on accountability by senior management, giving it some correlation with the requirements of Sarbanes Oxley Act of 2002 (P.L. 107-204).

# Supervisors' Role

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- Ensure that workplaces and equipment are safe, well-maintained, and in compliance with external (governmental and consensus) regulations, the SHMS, and corporate policies, programs, and practices;
- Ensure that workplace safety & health practices and procedures are clearly communicated and understood by employees through training programs;
- Enforce health & safety rules fairly and uniformly related to job performance;
- Evaluate employees on compliance with safe work practices;

# Supervisors' Role

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- Acknowledge employees who make significant contributions to maintaining a safe workplace;
- Discipline workers who fail to follow safety practices;
- Encourage employees to report workplace hazards and “near misses” without fear of reprisals;
- Maintain systematic workplace inspections, and correct identified health & safety deficiencies in a timely manner;
- Ensure that accidents, injuries/illnesses and “near misses” are reported and investigated promptly; and,
- Ensure that mandatory OSHA/MSHA records (e.g. training and certifications), and employee health monitoring/surveillance records are kept for the designated period(s) of time.

# Employees' Responsibilities

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- Stay informed of conditions affecting their health and safety;
- Participate in training programs;
- Participate in safety & health committees (where applicable);
- Participate in OSHA/MSHA inspections;
- Adhere to healthy and safe practices in their workplace; and,
- Promptly report potential hazards in the workplace, “near miss” events, injuries and/or accidents.

# Other S&H Programs for Benchmarking SHMS

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- OSHA Safety & Health Program Management Guidelines
- OSHA Ergonomics Guidelines (for various industries)
- OSHA Draft Safety & Health Program Rule
  - Federal Register: 1/26/89, 54:3904-3916
  
- ILO OSH 2001
  - Guidelines on Occupational Safety & Health Management Systems
  
- OHSAS – Occupational Health & Safety Assessment
  - 18001 Occupational Health & Safety Management Specifications
  - 18002 Occupational Health & Safety Management Systems Guidelines for the Implementation of 18001
  - Designed to integrate with both ISO 9001 (Quality Mgt Systems) and ISO 14001 (Environmental Mgt Systems).

# Conclusion

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- Workplace injuries and illnesses costs can be reduced through comprehensive S&H management.
- SHMS can be easily integrated into corporate and other management systems (ISO 9000 and 14000)
- OSHA imposes a non-delegable duty on employers to provide a safe and healthful workplace to those who work for the company or visit the worksite.
- MSHA has similar approach under its subjective standards, and is a strict liability statute.
- Safety & health management systems can help companies fulfill their legal and moral obligations.
- Management commitment and employee participation are the key elements of effective safety & health systems.

# Questions????

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