



AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

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Best Practices from the Star Valley Chapter

Star Valley Chapter Membership

November 12, 2018

Best Practices

- Chemical Management
- Slip, Trip & Fall Prevention
- An Inspection Program
- A Machine Guarding Program

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Chemical Management

Inventory Control and Regulatory Compliance

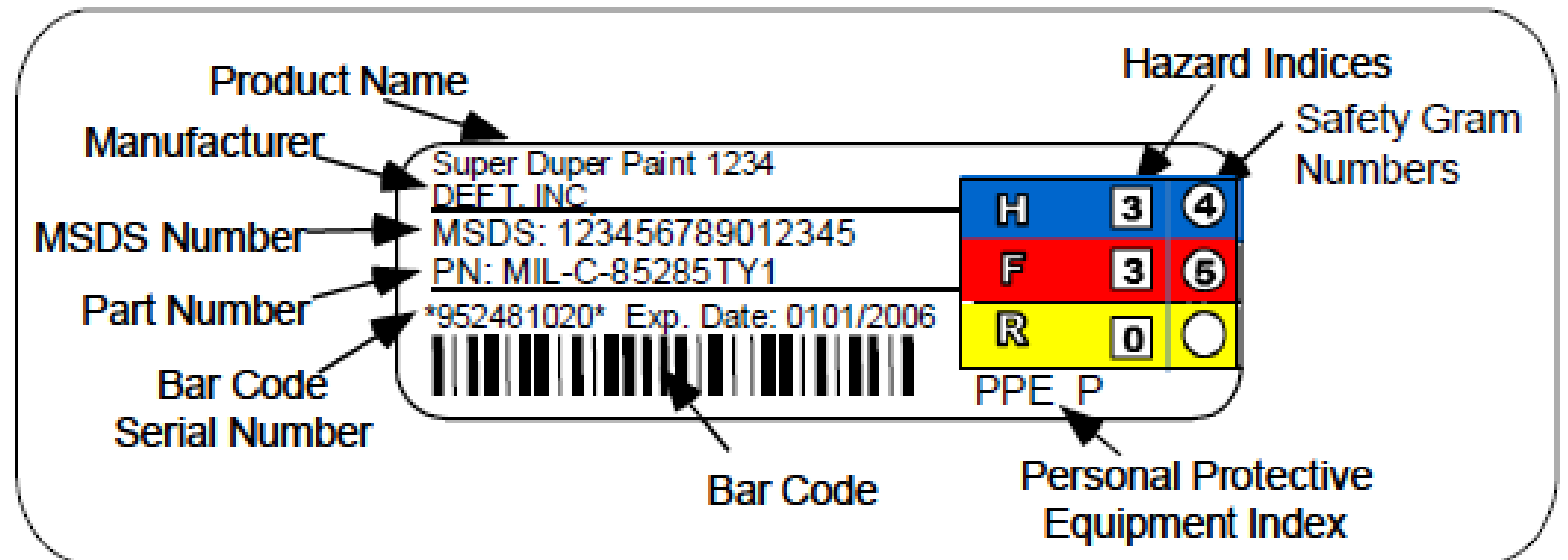
Chemical Management

- Inventoried all chemical products
- Identified similar products
- Selected two similar products for use
- Established a “pharmacy” to dispense & distribute chemicals and PPE
 - Eliminated dozens of flammable liquid lockers
 - Saved thousands in purchasing chemicals
 - Created a “K-Mart”, one-stop shopping

Chemical Management Continued

- Multipurpose Chemical Label

- Identifies product
- SDS number
- Part number
- Degree of Hazard
- Safety Gram ref.
- PPE Index
- Barcode



- Quantity use documentation by weight
- Air pollution permit records
- Respiration certification go; no-go

Slip, Trip & Fall (STF) Prevention

A Program Manual

STF Prevention

- Slip, trip and fall prevention encompasses the following elements:
 - Organizational responsibility assignment
 - Hazard assessments techniques
 - Slip, trip and fall prevention by design
 - Slip, trip and fall prevention by administrative controls
 - Personal protective equipment
 - Inspections
 - Reporting Unsafe Conditions
 - Reporting slips, trips & falls
 - Accident/Incident Investigation
 - Training



STF Prevention Policy

- Policy:
 - It is the policy of x to provide a workplace free of recognized hazards.
 - A key point in this policy is the design, installation and maintenance of flooring and work surfaces that are free of slip, trip and fall hazards.
- Responsibilities
 - Senior management: assuring that personnel and economic resources are sufficient to implement this plan.
 - Facilities largest role in slip, trip and fall prevention.
 - Designs building layouts, has facilities maintenance contract oversight, and has responsibility for repair and facilities-related problem resolution.
 - Process Designers related to materials and equipment
 - Responsible for engineering out preventing slip trip or fall hazards by engineering and/or administrative controls and/or process substitution.

STF Prevention Responsibilities

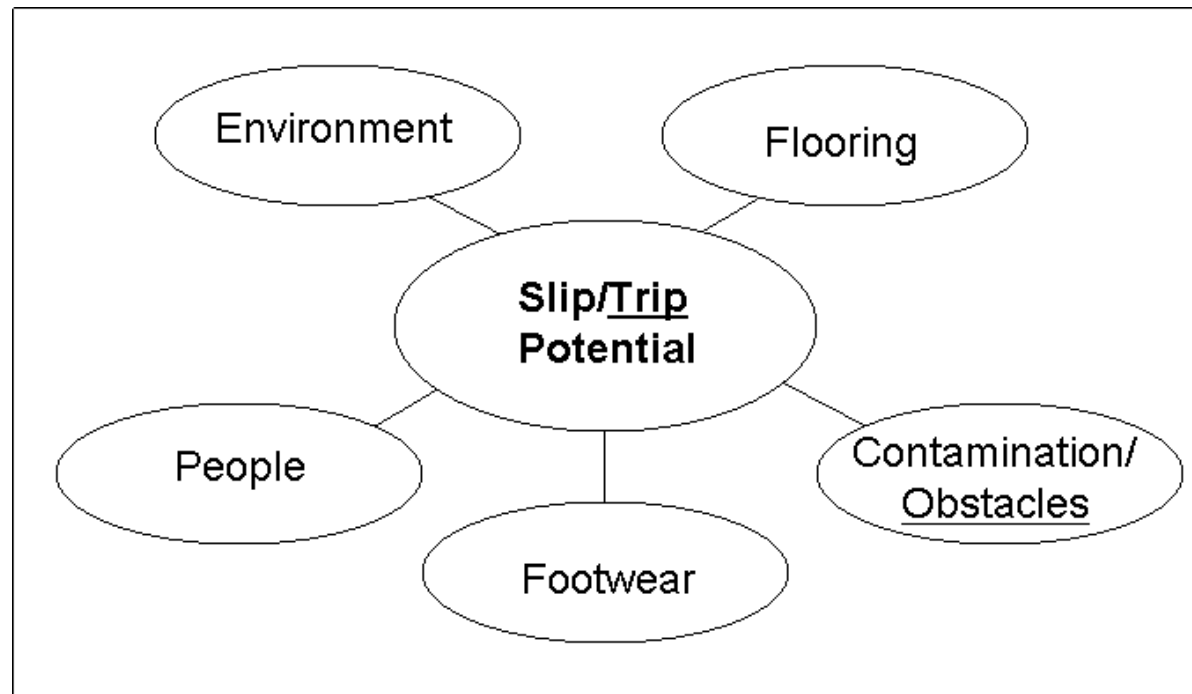
- Supervision:
 - Maintaining the work environment free from recognized hazards.
 - Addressing unsafe conditions/actions that could cause a slip, trip or fall.
 - Investigation all injuries.
- All Personnel:
 - Observing facility signs and warnings regarding the presence of slip, trip and fall hazards
 - Reporting slip, trip or fall hazards and incidents
- Contractors:
 - Keep assigned walking/work surfaces free from slips, trips and falls and identify areas where surfaces may be conducive to slips, trips or falls.

STF References

- 29 CFR 1910 Subpart D, Walking/Working Surfaces
- 29 CFR 1926 Subpart C, General Safety and Health Provisions
- ANSI A117.1, Specifications for Making Buildings and Facilities Accessible to, and Usable by, Physically Handicapped
- ANSI A1264.2-2001, Provision of Slip Resistance on Walking/Working Surfaces
- ASTM C1028-89, Test Method for Ceramic Tiles
- ASTM F1679-96, Test Method for using English XL
- National Fire Protection Association 101, Life Safety Code
- Public Law 101-336, Americans with Disabilities Act

Hazard Assessment

- Performed in accordance with ANSI/ASSE A1264.1-2001, Standard for the Provision of Slip Resistance on Walking/Working Surfaces.
 - Analyzing factors



Analysis of Risk Factors

- Slip Hazards

- Environment
- Flooring – material & treatment
- People – Gait dynamics affected by age, disabilities, health & emotional state
- Footwear types
- Contamination of floor surfaces

- Trip Hazards

- Environment – changes in elevation, carpet transition, thresholds, stairways or ramps
- Obstacles
- Environment, flooring, people etc.

Design Considerations

- **Flooring Materials**

- The Americans with Disabilities Act Accessibility Guidelines (ADAAG) requires newly-constructed or altered ground and floor surfaces of accessible routes on sites and in buildings and facilities are stable, firm, and slip-resistant.
- All flooring materials planned for use must be reviewed and approved by ESH&M to help assure proper flooring is provided based on application, tasks and processes. In selecting proper flooring, credence shall be given to:
 - Flooring materials
 - Slope of travel
 - Activities and processes having the potential to create slip and trip hazards
 - Characteristics flooring exhibits when wet or exposed to contaminants possible that may be found in the area where the floor is located

Design Considerations Continued

- **Floor Treatments**

- Where it is not practical to replace flooring, techniques including but limited to, etching, scoring, grooving, brushing, appliqués, coatings, tapes and sprays shall be used to provide acceptable slip resistance.
- Facilities and ESH&M evaluation of flooring and the work environment to identify appropriate control methods.
 - This evaluation could include bringing in experts in the field such as manufacturer's representatives, consultants and sellers

STF Administrative Controls

- Housekeeping Program:
 - Written Maintenance Procedures:
 - Established cleaning schedules
 - Use of signs where cleaning operations are occurring which alert employees of potential slip hazards
 - Timely reporting and cleanup of conditions that can result in STFs.
 - Training:
 - Inspection, maintenance and cleaning requirements
 - Inspection, maintenance and cleaning methods
 - Safe handling and disposal of chemicals and/or solutions
 - Safe operations of maintenance and cleaning equipment
 - Recordkeeping and reporting related to housekeeping and maintenance

STF Administrative Controls Cont'd

- Training Definitions

- Fall: Occurs when a person's center of gravity is shifted such that balance can no longer be maintained.
 - Falls from slips and trips include falls from walking surface to the same level, from walking surfaces at different levels, from ladders, from stairways, and from ramps
- Slip: A slip is a fall on the posterior.
 - Slips occur when a person's foot or feet unexpectedly slide(s) on the walking surface.
- Trip: a trip is a fall on the face.
 - Trips occur when a person's foot unexpectedly encounters an unseen object, sticky surface or step-down on the walking surface.

Monitoring for STF Conditions

- Supervisors:
 - Inspecting all walking surfaces under the supervisor's responsibility
 - Promptly notifying personnel responsible for clean up
 - Placing signage, barriers or personnel until clean up is complete
- All employees:
 - As a part their role in the accident prevention program, to report any unsafe condition or concern via the “report a concern” website
- ESH&M

STF Prevention Devices and Methods

- Rugs, Mats and Runners
 - Installation: when walking surfaces do not meet slip resistance criteria or to address slippery conditions related to inclement weather
 - Placement: provided at door entrances where tile, linoleum or other potential slippery surface is present.
 - Mats/runners should be at least 10 strides long to properly dry shoe soles.
 - Foot prints or water prints should not be seen on the floor beyond mat
 - Shall be adequately secured to prevent movement
 - Inspection & change out often before saturation such that they can no longer absorb moisture; develop mold or become damaged

Prevention Devices & Methods Cont'd

- Rugs, Mats and Runners
 - Maintenance: Procedures shall be established to assure cleanliness and function of rugs, mats and runners.
 - Degree of maintenance required is dependent inspections.
 - Procedures: for placement, maintenance, inspection and storage
 - When stored, must be done in a way that prevents curling of the edges.

Prevention Devices & Methods Cont'd

- Warnings provided whenever a slip/fall hazard has been identified until appropriate corrected.
 - Symbols and Warning Signs – Shall be used to identify slip/fall hazard. Suggest meet ANSI Z535.3-1991, Criteria for Safety Symbols.
 - Barricades - For slip/fall hazards that cover an entire walkway where personnel cannot be safely routes around the hazard.
 - Employee assignment – for detouring personnel traffic until a barricade and signage can be erected or hazard is removed
 - Controlling access to authorized personnel
- Wet umbrella bags & stands
- Use of ladders (no chairs!)



Footwear

- Appropriate for work task and areas.
 - Health and Safety Guide require “sturdy, low-heeled shoes” be worn.
 - “High-heeled, open-toes shoes are prohibited in shop areas and are not recommended on stairs and on many pavements and floors”.
- Special Applications ;
 - Some activities, such as aircraft wash and wing walking, require the use of special shoes or shoe covers.
 - All personnel must be familiar with and wear the required personal protective equipment specified by procedure or supervision direction.
 - Wherever possible, slip resistant shoes shall be worn.
- Shoe Selection Criteria.
 - Shoes must be selected based on flooring, job tasks and exposure to hazards.
 - Tread design is critical. Special attention is required for the heel of the shoe and indoor or outdoor use.



An Inspection Program

A Program Manual

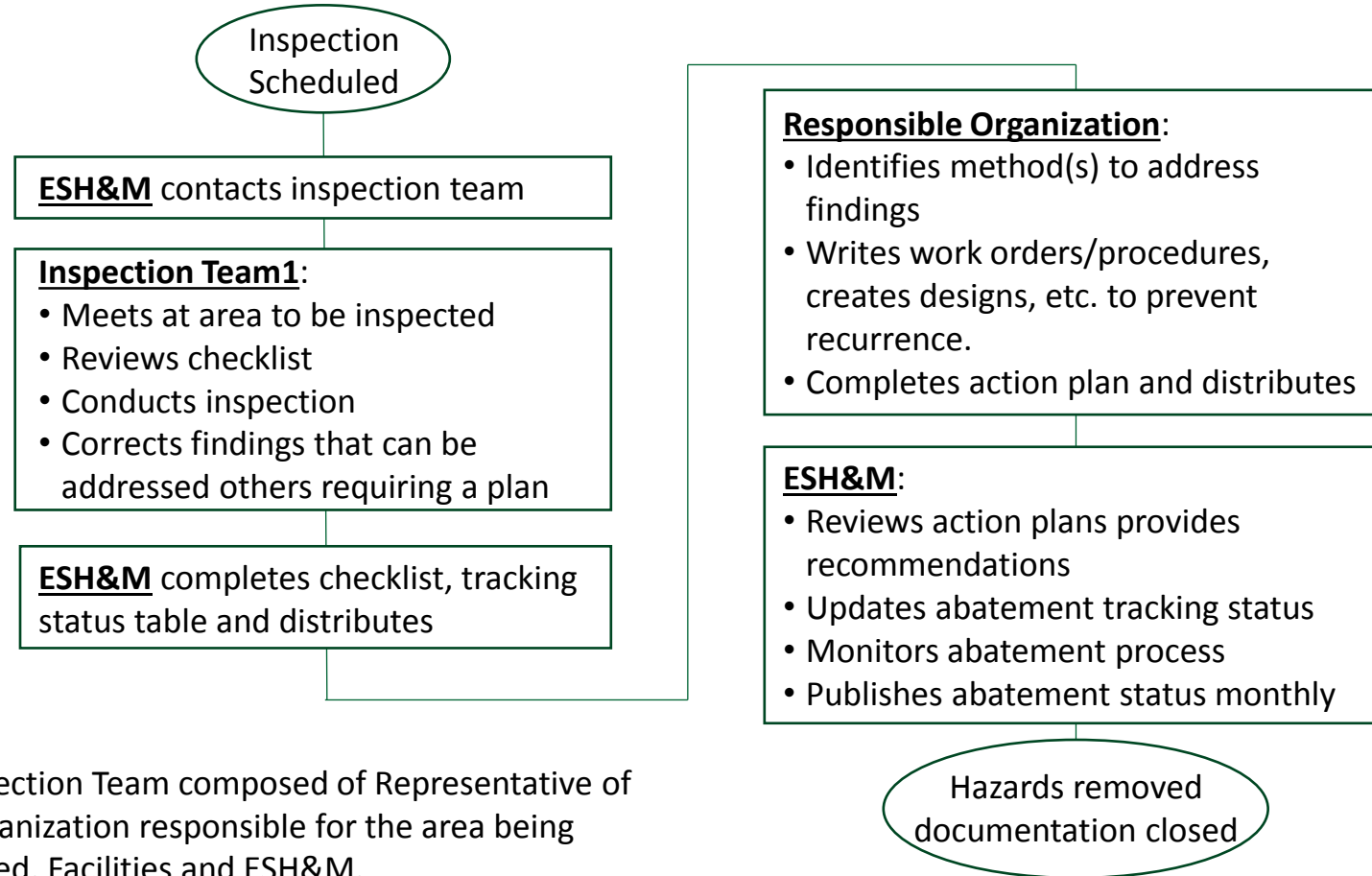
Inspection Program Overview

- Fundamental to the preservation of a hazard-free workplace whose purpose include:
 - Identify and evaluate hazards before they result in process defects
 - Check results of the inspection against procedures and standards
 - Identify and act upon behavior which could result in loss incidents
 - Reach first-hand agreement and resolution with responsible parties
 - Measure safety performance
 - Display supervision's sincerity about safety performance
 - Determine if the resources being expended by the company in it's hazard abatement program is justified

Inspection Program Overview Cont'd

- Responsibilities for:
 - Senior Management
 - Support program, provide resources, etc.
 - Site Management
 - Participates in inspection
 - Expeditiously takes_action_to repair or resolve safety deficiencies in work areas
 - Safety Department (ESH&M)
 - Develops inspection checklists
 - Prepares and distributes report

Inspection Program Overview Cont'd



Inspection Checklist

- Incorporates categories specific to area including fire and life safety adopted standards as “tallies”, number of occurrences
 - Categories have assigned criticality factors weighted based on the potential severity and frequency of the discrepancy

ESH&M Inspection Finding Priority Determination Chart	Occurrence Potential (Frequency)		
	Frequent	Probable	Remote
<u>Catastrophic</u> An event that may cause severe personnel injury/substantial damage to aircraft, facilities, or equipment in excess of \$500,000.	RED	RED	YELLOW
<u>Critical</u> An event that may cause personnel injury damage to aircraft, facilities, or equipment between \$100,000 and \$500,000.	RED	RED	YELLOW
<u>Marginal</u> An event that may cause minor damage to aircraft, facilities, or equipment between \$1000 and \$100,000.	RED	YELLOW	YELLOW
<u>Non-compliance</u>	RED	YELLOW	YELLOW

Inspection Checklist Continued

- **Priorities (Red & Yellow):**

- Grievous or serious discrepancies of the OSHA or contractual safety standards and regulations that requires immediate action to prevent personnel injury or illness or damage to facilities and assets.
- Can be cited by an OSHA compliance officer
- Requires immediate action to abate the hazard (i.e. LOTO, establishing barriers to prevent exposure, etc.
- Has the potential to become more severe and/or costly if not resolved.
- Red priority doubles tally
- Completion of an abatement plan within 5 days. Failure to submit elevates to the next level of Management.

Inspection Checklist Continued

- Safety score (tally frequency & severity score) indicates safety “health”

Safety Score	# Tallies or Average Tallies
Blue	1 Tallies
Green	2 - 6 Tallies
Yellow	5 - 10 Tallies
Red	> 10 Tallies

Inspection Finding Abatement

- Each inspection finding listed and attached to inspection report.
 - Finding/Observation Number
 - Finding/Observation Description and Priority Code
 - Organization and Person Responsible for Correction
 - Hazard Description/Comments
 - Status/Suspense Date
 - Days Delinquent (if necessary)

Inspection Finding Abatement Continued

- Documents and tracks actions closure
- Published each month until each finding is closed.
- “Days delinquent” metric measures responsiveness in addressing and closing discrepancies



A Machine Guarding Program

Guarding & Shop Safety

Applicability & Purpose

- Applies to safeguarding machines, tooling, related systems & processes & shop practices
- Program composed of
 - Policy
 - Employee Safety
 - Guarding Techniques
 - Inspections
 - Maintenance
 - Machine Controls
 - Power Press Safety
 - Procurement of Machinery
 - Modification of Machinery
 - Risk Assessments
 - Training
 - Emergencies
 - Machine Guarding Committee
 - Responsibilities

Related Forms

- Light Curtain Laser Scanner Checkout Procedure
- Function-testing Procedure for Two-hand Controls
- Function-testing Procedure for Two-hand Trips
- Emergency Stop Function-testing Procedure
- Interlock Function-testing Procedure
- Safety Mat Function-testing Procedure
- Mechanical Power Press Weekly Inspection & Test Record

Policy

- The National Safety Council has determined the most frequent cause of injuries related to industrial machinery is due to unsafe work practices and use of incorrect procedures. To assist in preventing these injuries, the following five-point policy has been established:
 - Operation, adjustment and repair of any machine tool is restricted to authorized, trained personnel.
 - Each machine must be operated in accordance with good work habits. Taking short cuts, performing unauthorized tasks, and using equipment as it was not intended is prohibited.
 - Each machine must be evaluated to determine if guards are in place and machine is operating as intended at the start of each shift or upon first use.
 - Supervision is responsible for enforcement of this policy.
 - Any injury from industrial machinery, no matter how slight, must be reported in accordance with established procedure.

Employee Safety

- Utilize proper guarding and established procedure
- Wear proper attire:
 - Loose-fitting clothing, jewelry or other items that can be entangled in machinery is prohibited
 - Personnel with long hair shall wear their hair under a cap or otherwise contained.
- Immediately report defective/misaligned guards to supervision
- Ensure material , scraps, etc., do not accumulate as create a hazardous condition
- During machine operation, listen for new vibrations or noises that could indicate loose parts, overloading, lubrication issues or other potential problems. Upon detection, immediately stop machine and report observations to supervision.

Machine Guarding Techniques

- Machines where the point-of-operation (POO) exposes employees to injury shall be guarded
- Guard shall be so designed and constructed to prevent the operator from having and body part in the in the danger zone during operation
- Operator should not be allowed to reach over, around or through the guard to reach the POO.
- Method choices are identified.

Special Tools

- Special hand tools can be used for placing and removing material to and from the POO without the operator placing their hand in danger zone
- Hand tools may not be used in lieu of required guarding, tools are supplementary protection.

Safety Shields

- Not a substitute for traditional guarding. Are considered awareness devices, that can be used if certain criteria is met:
 - Approved by Safety
 - Direct contact to the POO with any part of the operator's body cannot be made
 - Shield construction must be substantial enough to provide protection upon contact.
 - Supplement hand tools are used.
 - Shields are situated such that maximum distance protection is provided.
 - Shields are inspected prior to use as shield deteriorate (become opaque and brittle) with age, use, exposure to chemicals.

Testing of Control Devices

- Devices: interlocks, presence-sensing devices(light curtains, scanners, mats etc.), two-hand controls & two-hand trips
- Testing in accordance with manufacturer's recommendations
- Typically upon installation, maintenance, adjustment, repair or modification or device removal/disabling
- Light curtains after “channel select” or “floating blank” enable/disabling
- Use manufacturer's test forms or prepared forms meeting criteria

Power Press Safety (OSHA)

- Especially mechanical power presses
- Dies identification (press tonnage stroke requirements, weights, special transfer instructions)
- Die-setting procedures
- Safety block usage & installation
- Inspection requirements
- Power press related injuries reported to OSHA within 30 days

Procurement of Industrial Machinery

- Shall meet specified design standards to ANSI standards is desirable – Most OSHA standards are 60 years old
- Machines designed and built to European (CE), international (ISO) or other standards are not recognized by OSHA
 - Electrical most important NEC/NFPA 79
 - Risk assessments
- Specify BS EN ISO 12100:2010 assessments
 - Makers producing for international markets required to provide assessments so that users can analyze risk & develop safeguards to address identified hazards

Machinery Modification

- Machine's manufacturer must be consulted to assure anticipated modifications will not void warranties, create unforeseen hazards or production issues.
- Risk assessment recommended to assure personnel safety and regulatory compliance is not compromised
- Instructions related to modified machinery must be evaluated to address any new use, operating or maintenance procedures

Risk Assessments

- Performed by procedural guidelines for machines that:
 - Present more than a tolerable risk
 - Potential exposure to the point-of-operation or other hazards
 - Where there is a history of incidents related to machine or tasks
 - Designed in-house machines
 - Incorporate presence-sensing devices
 - Used machinery purchased by the company

Training

- Required for all personnel operating, inspecting or maintaining machinery
- OSHA-required training for operators of mechanical power presses:
 - Safe methods of work before initially operating the press
 - Must be adequately supervised to assure correct procedures are observed
 - Operators, inspectors and maintainers must demonstrate continuing competence to their training
 - Inadequate personnel shall be retrained at a minimum

Machine Emergencies

- Designate trained, response personnel to address machine issues such as:
 - Power presses or other machines that could entrap personnel or
 - Most likely would immediate medical attention as a result of machine incident
- Emergency instructions developed for some machines include:
 - Machine drawing with identification of referenced parts
 - Event description symptoms of failure with actions by sequence with photos
 - Extrication instructions
 - Emergency contacts & instructions
 - List of emergency tools & equipment (wrenches, lifting devices, PPE

Machine Guarding Committee

- Purpose:
 - Perform assessments in accordance with regulatory requirements and guidance and best industry practices
 - Recommend machine safeguards and operating methods to protect operators & area personnel, machinery, products and facilities
 - Assist supervision regarding their machine guarding responsibilities
- Composed of representatives from engineering, production, safety and supervision from areas of interest

Responsibilities

- Assigned to:
 - Managers (provide resources to implement & maintain machine guarding program)
 - Supervision (assure personnel are trained, understand operation, enforce safe work practices, etc.)
 - Engineers (Obtain approval to purchase; assure manufacturer's specifications & requirements are incorporated; develop operating procedures, etc.)
 - Industrial Engineering (Assure manufacturer's requirements are incorporated into PMs; provide maintain instructions; train personnel)
 - Employees (Complying with program requirements)

Appendices

- Principles & Applications:
 - Machine Guarding methods, advantages, limitations
 - Safe guarding devices, advantages, limitations
 - Supplemental guarding methods (hand tools/fixtures etc.)
 - Machine controls (descriptions, functions, identification,
 - Accessories & lighting
 - Machine marking & safety signs
 - Testing & verification
- Samples of safety device checkout procedures

Machine-related Accident Investigation

NOG-L	Machine-related Accident Investigation Form		Report No
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Accident Date & Time		Accident Location	
Machine Involved (Name; Model; S/N; SAP#):			
Operator/Supervisor Interview Details			
Name(s):		Title:	
Hours on the job at the time of the incident:			
Injured in incident?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	If Yes, extent of injury:
Witness?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	If Yes, name of witness::
Task being performed at the time of the incident:			
Task a normal part of the job? <input type="checkbox"/>		Operator authorized to perform task? <input type="checkbox"/>	Operator trained? <input type="checkbox"/>
Procedure established to perform task? No <input type="checkbox"/> Yes <input type="checkbox"/>		If yes, procedure number:	
Unusual sights & sounds observed?	No <input type="checkbox"/> Yes <input type="checkbox"/>	If yes, specify:	
Defects detected?	Machine? No <input type="checkbox"/> Yes <input type="checkbox"/>	If yes, specify:	
	Part/material? No <input type="checkbox"/> Yes <input type="checkbox"/>	If yes, specify:	
Environmental Conditions:	Lighting: <input type="checkbox"/> Inadequate	Temperature: <input type="checkbox"/> excessive	Noise: <input checked="" type="checkbox"/> Excessive
	Airborne Contaminants: No <input type="checkbox"/> Yes <input type="checkbox"/>	Other:	
	If yes, contaminant:		
Possible incident cause(s):			
Recommended incident recurrence prevention:			
Sketch			

Machine-related AI Continued

NOG-L		Machine-related Accident Investigation Form		Report No
Identified Hazards & Notes				
Machine Hazards				
<input type="checkbox"/> Bending components <input type="checkbox"/> Blade contact @ POO <input type="checkbox"/> Caught on or between <input type="checkbox"/> Crushing <input type="checkbox"/> Cutting <input type="checkbox"/> Debris drops @ rear of machine <input type="checkbox"/> Ejected parts (stock/tooling/dies/chuck key) <input type="checkbox"/> Entanglement <input type="checkbox"/> Feed mechanisms <input type="checkbox"/> Nip points <input type="checkbox"/> Pinch points		<input type="checkbox"/> Punch <input type="checkbox"/> Pulleys <input type="checkbox"/> Punch alignment (flake/explosive fracture) <input type="checkbox"/> Rear of machine blade/pinch hazards <input type="checkbox"/> Reciprocating arms <input type="checkbox"/> Rotating cutter <input type="checkbox"/> Rotating parts <input type="checkbox"/> Shear points <input type="checkbox"/> Struck by part ejection (chuck key, work piece) <input type="checkbox"/> Transverse moving parts <input type="checkbox"/> Other		
Auxiliary Equipment Hazards				
<input type="checkbox"/> Auxiliary parts of moving belts <input type="checkbox"/> Improperly secured materials <input type="checkbox"/> Improper setup/lack of maintenance		<input type="checkbox"/> Pinch point @ hold-down/hand slots/throat gap <input type="checkbox"/> Unprotected foot pedal <input type="checkbox"/> Other		
Process Hazards				
<input type="checkbox"/> Debris from broken components <input type="checkbox"/> Flying metal chips, shavings, lubricants, sparks and/or cooling fluids		<input type="checkbox"/> Slip/trip condition <input type="checkbox"/> Other		
Ergonomics				
<input type="checkbox"/> Compression/contact stress <input type="checkbox"/> Force <input type="checkbox"/> Heavy lift <input type="checkbox"/> Overexertion <input type="checkbox"/> Noise <input type="checkbox"/> Physical demands <input type="checkbox"/> Posture:		<input type="checkbox"/> Repetition <input type="checkbox"/> Temperature extremes <input type="checkbox"/> Vibration <input type="checkbox"/> Contaminants: Air/gas/aerosol <input type="checkbox"/> Liquid <input type="checkbox"/> <input type="checkbox"/> Other		
PPE				
<input type="checkbox"/> Clothing <input type="checkbox"/> Eye	<input type="checkbox"/> Face <input type="checkbox"/> Hand	<input type="checkbox"/> Head <input type="checkbox"/> Hearing	<input type="checkbox"/> Respiratory <input type="checkbox"/> Fall	
<input type="checkbox"/> Other:				
Safety Equipment				
<input type="checkbox"/> Awareness barriers		<input type="checkbox"/> Hand tools		<input type="checkbox"/> Other:
Report Prepared by:				
Name:		Phone number:		Date:
<input type="checkbox"/> Additional comments attached			<input type="checkbox"/> Associated report(s):	



Questions/Comments

Thanks for your attention!