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**National Institutes of Health
Office of Research Services
Division of Occupational
Health and Safety**

Providing a safe and healthy environment for employees, patients and visitors.

“Safe science and good science go hand-in-hand.”

The articles in this Newsletter are intended to provide general summary information to the National Institutes of Health (NIH) community. They are not intended to take the place of either the written law or regulations. It is not NIH's intention to provide specific advice to readers of this Newsletter, but rather general information to help better understand how to prevent or reduce workplace injuries and illnesses. Reference in this Newsletter to any specific commercial products, process, service, manufacturer, or company does not constitute its endorsement or recommendation by the U.S. Government or NIH.



Process Safety Management

The major objective of Process Safety Management (PSM) is to prevent unwanted releases of highly hazardous chemicals. The PSM standard requires employers to minimize hazards through the use of analyses, operating procedures, employee training, safety reviews, management of change, incident investigations, etc.

Employees play a key role in implementing all of the PSM standard's requirements; and employers should nurture the necessary expertise, experience, judgment, and initiative within their workforce.

However, after becoming familiar with a process, employees tend to become complacent and ignore minor changes. This is dangerous when the process involves highly hazardous chemicals. For this reason, employees are required to receive PSM refresher training. Your employer is responsible for determining when refresher



training is needed. It must be provided at least every three years.

Training is also required as part of any pre-start safety review. A pre-start safety review must be conducted whenever the process undergoes a significant modification that requires a change in the process safety information.

Overview

The PSM rule is designed to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. To do this, all covered processes must be monitored to ensure they are operating within safe limits.

A process is any activity involving a highly hazardous chemical, including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or the combination of these activities.

The standard includes a listing of covered highly hazardous chemicals and their threshold amounts. When a chemical process involves use of a chemical at, or above, its threshold value, all of the requirements of the PSM standard must be met. Processes using flammable liquids or gases can also be covered under some circumstances.

General safety and health considerations

The chemicals used in a process each present physical and health

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Process Safety Management *(continued from page 1)*

hazards that need to be identified and evaluated. When combinations of chemicals are used, their interactions can create new hazards that must be addressed.

Once all of the hazards have been identified, the appropriate precautions that need to be taken to prevent overexposures or releases can be determined.

Engineering controls, such as exhaust ventilation, containment, or pressure relief valves, can be designed and implemented. Work practice controls, such as safe storage and handling procedures, can be outlined.

Communication and training plays a big part in getting the process to run safely. Everyone needs to be aware of all of the above considerations.

Safe operating limits

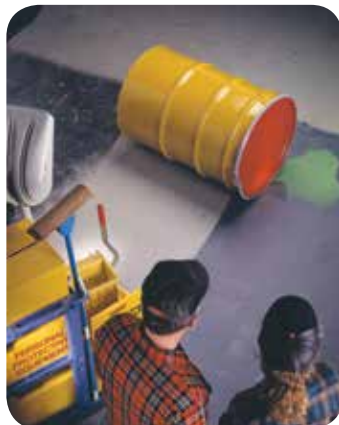
Operating procedures detail the steps to follow to make sure that all of the control measures are in place. The operating instructions give you an idea of the operating limits of the process. Some of the operating limits could include:

- Voltage and amperage limits of the equipment;
- Pressure limitations;
- Temperature ranges;
- Mass or volume limits;
- Corrosive properties of the chemicals in the process and their effects on the equipment; or
- Critical time constraints involved in the proper functioning of the process.

Emergency procedures

When a process involving a highly hazardous chemical experiences a failure, proper emergency response is crucial to protecting lives. Operators must be prepared to follow the proper emergency shut-down procedures.

Everyone must know how to report an emergency. Report any incident that could have resulted in a catastrophic release of chemical. Every incident must be investigated to make sure steps are taken to keep the process safe. The incident investigation report will be reviewed with the workers who were affected by the incident.



Elements of the PSM standard

Some PSM provisions are complicated and need to be addressed by engineers, but all employees should be aware

of them. Employee participation is an important part of the PSM standard. Processes that involve the use of highly hazardous chemicals can be run safely, and each of the elements of the standard works to control the risks.

The individual elements of the PSM standard include:

- Employee participation;
- Process safety information;
- Process hazard analysis;
- Operating procedures;
- Employee training;
- Contractors;
- Pre-startup safety review;
- Mechanical integrity of equipment;
- Hot work permits;
- Management of change;
- Incident investigations;
- Emergency planning and response;
- Compliance audits; and
- Trade secrets and documentation.

Working with contractors

It is common for contractors to work on process equipment. The employer should evaluate contractors' safety records before allowing them to work in and around processes where they will be involved in repair, renovation, or specialty work. The employer needs to instruct the contractor about the fire, explosion, or toxic release hazards that are related to the contractor's work and must describe the applicable provisions of the emergency action plan. The employer must also follow safe practices to control the entrance, presence, and exit of contract employers and contract employees in process areas.

Contract employers must ensure that each of their employees has been trained in the hazards and safe practices. Contractors are responsible for informing the facility about any unique hazards associated with their work, and for reporting any hazards found during their operations.



Safety focus: Proper use of faceshields

Impact injuries are most commonly the result of flying or falling objects, or from sparks entering the eye. Many these objects are smaller than a pin head and yet can cause serious injuries such as punctures, abrasions, and contusions.

Faceshields are great protectors for the entire face against exposure to impact hazards. However, they are not to be used as primary eye protection, according to the Occupational Safety and Health Administration (OSHA). They should only be used to supplement primary eye protection, such as spectacles or goggles. When worn alone, faceshields do not protect employees from impact hazards, OSHA says.

OSHA recommends that employees use faceshields in combination with safety spectacles or goggles, even in the absence of dust or potential splashes, for additional protection beyond that offered by spectacles or goggles alone.

Faceshield windows

Faceshield windows are made with different transparent materials and in varying degrees or levels of thickness. These levels should correspond with specific tasks.

Faceshield windows extend from the brow to below the chin and across the entire width of the face.

Windows are available in both removable or lift-front designs:

- Removable windows allow the replacement of damaged windows; and
- Lift-front windows may be raised, as needed, or left in the lowered position.



Plastic windows:

- Protect against light impact;
- May include a glass insert; and
- Are available clear or filtered.

Wire-screen windows:

- May include a plastic/glass insert;
- Protect against some moderate impact; and
- Are not recommended for use involving chemical or liquid hazards.

Headgear

Headgear supports the window shield and secures the device to the head.

Adjustable headgear:

- Includes straps that allow the user to manipulate the size of the headgear to ensure a proper fit; and
- Allows faceshields to be shared between employees.



Hard hats with faceshields:

- May have a window shield mounted under the visor of the hat; and
- Includes faceshields that may be plastic, wire-screen, lift-front, or removable.



Training

Employers must provide eye and face protection training to employees who are required to use it. The training must include the following:

- Explanation on why the eye and face protection is necessary and how improper fit, use, or maintenance can compromise its protective effect;
- Limitations and capabilities of the eye and face protection;
- Effective use in emergency situations;
- Inspection of the equipment;
- Proper way to put on and remove the devices;
- Maintenance and storage of the equipment;
- Recognition of medical signs and symptoms that may limit or prevent effective use; and
- General requirements of OSHA's eye and face protection standard (29 CFR 1910.133).



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The purpose of this newsletter is to provide a forum for the dissemination of health and safety information. It is intended to enhance communication to National Institutes of Health (NIH) employees, raise awareness of current safety policies and procedures, and provide guidance on relevant issues. It is provided as a service by the NIH, Office of Research Services, Division of Occupational Health and Safety.

For more health, safety and services information, visit the NIH, Office of Research Services, Division of Occupational Health and Safety's website at: <http://www.ors.od.nih.gov/sr/dohs> or call us at: (301) 496-2960.

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3 reasons not to delay your eye exam

"Success is to be measured not so much by the position that one has reached in life as by the obstacles which he has overcome."

Booker T. Washington

There are many things we can do on our own to maintain good health, from eating right to setting aside time for exercise. When it comes to making sure our eyes are in top shape, however, we need a professional's input.

Regular eye exams provide us with information we simply can't gather on our own. They are important to our health because:

- 1. Warning signs are missing.** Eye conditions such as glaucoma, diabetic eye disease, and age-related macular degeneration often have no early warning signs. Visiting an eye care professional is the only way to be sure that your eyes are healthy. During a dilated eye exam, the back of the eye is examined for signs of damage or disease.
- 2. Early treatment helps.** An exam catches eye diseases at an early stage, when they're most treatable. Timely treatment of diabetic retinopathy protects against vision loss. Surgery can improve eyesight in people with cataracts. Early detection

and treatment control glaucoma and stop vision loss.

- 3. Eye care pros have insights.** During an exam, you have the opportunity to ask questions. Maybe you'd like to know more about safety eyewear for sports, or workplace eye protection. The examiner will likely ask about family history of eye disease, but if the question isn't asked, bring up the topic. Many eye diseases are hereditary, and an eye care professional can tell you how to reduce your risk of vision loss.

Common causes of vision loss

Cataracts. Clouding of the eye's lens, which usually develops slowly. Blocking the sun's ultraviolet rays with sunglasses or a hat may help delay cataracts.

Diabetic retinopathy. Damage to blood vessels in the back of the eye. It can develop in anyone with type 1 or 2 diabetes. Management of blood sugar and blood pressure reduces the risk for the disease.

Glaucoma. A group of diseases that damage the eye's optic nerve. The damage is usually caused by increased pressure within the eye. Early treatment protects against vision loss.

Age-related macular degeneration. Condition impacting the eye's macula, which allows you to see detail. It is caused by abnormal blood vessel growth or the thinning of the macula.



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