Illinois OSHA Information
www.osha.gov

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Sanitation and 5S+1 Resources

OSHA Chemical Database
www.osha.gov/web/dep/chemicaldata/#target

OSHA Cleaning Industry Resources
www.osha.gov/dcsp/products/topics/cleaningindustry/index.html

OSHA Guidance on Preparing Workplace for Influenza Pandemic
www.osha.gov/Publications/OSHA3327pandemic.pdf

OSHA Small Business Handbook
www.osha.gov/Publications/smallbusiness/small-business.html

OSHA Walking and Working Surfaces Resources
www.osha.gov/SLTC/walkingworkingsurfaces/index.html

National Institute for Occupational Safety and Health Small Business Resources
http://www.cdc.gov/niosh/topics/smbus/

National Institute of Standards and Technology, Manufacturing Extension Partnership
www.mep.nist.gov/manufacturers/services/lean/5s-system.htm

Material Safety Data Sheet (MSDS) Search Resources
www.cehs.siu.edu/Chemical/msds.htm

Lockout/Tagout/TPM Resources

OSHA Lockout/Tagout Fact Sheet
www.osha.gov/OshDoc/data_General_Facts/factsheet-lockout-tagout.pdf

OSHA Lockout/Tagout eTool
www.osha.gov/dts/osta/lototraining/index.html

OSHA Lockout/Tagout Resources
www.osha.gov/SLTC/controlhazardousenergy/otherresources.html

OSHA Publication Safeguarding Equipment & Protecting Employees from Amputations
www.osha.gov/Publications/osha3170.pdf

National Institute for Occupational Safety & Health Alert
www.cdc.gov/niosh/99-110.html

National Institute of Standards and Technology, Manufacturing Extension Partnership
www.mep.nist.gov/manufacturers/services/lean/totalproductive-maintenance.htm

Fuss & O'Neill Manufacturing Solutions
www.fando.com

Confined Spaces Resources

OSHA Confined Space Expert Advisor
www.osha.gov/dep/etools/eprcs/index.html

National Institute for Occupational Safety & Health Confined Spaces Resources
www.cdc.gov/niosh/topics/confinedspace/

Illinois Onsite Safety & Health Consultation Program Confined Spaces Resources
www2.illinoisbiz.biz/osha/cnfsp/prcs_index.htm

American Industrial Hygiene Association Confined Spaces Committee
www.aiha.org/content/insideaiha/volunteer%20groups/confspacecomm.htm

Initial Cleaning Plan

Target Area: _____

Directions:
1. Identify the target area and enter it above.
2. Decide what the task is and where it should happen, and list it in the appropriate column below.
3. Decide who will perform the task and when, and list it below.
4. Determine which materials and tools you need and list them below.

Task	Location	Who	When	Materials and Tools Needed

Workplace Scan Checklist

Number of Problems	Rating Level		Date	Date	Date
5 or more	Level 0				
3-4	Level 1				
2	Level 2				
1	Level 3				
none	Level 4				

Category	Item	Level		
Sort	**Distinguish between what is needed and what is not needed**			
	Unneeded equipment, tools, furniture, etc. are present			
	Unneeded items are on walls, bulletin boards, etc.			
	Items are present in aisle ways, stairways, corners, etc.			
	Unneeded inventory, supplies, parts, or materials are present			
	Safety hazards (water, oil, chemical, machines) exist			
Set in Order	**A place for everything and everything in its place**			
	Correct places for items are not obvious			
	Items are not in their correct places			
	Aisle ways, workplaces, equipment locations are not indicated			
	Items are not put away immediately after use			
	Height and quantity limits are not obvious			
Shine	**Cleaning, and looking for ways to keep clean and organized**			
	Floors, walls, stairs, and surfaces are not free of dirt, oil, and grease			
	Equipment is not kept clean and free of dirt, oil, and grease			
	Cleaning materials are not easily accessible			
	Lines, labels, signs, etc. are not clean and unbroken			
	Other cleaning problems (of any kind) are present			
Standardize	**Maintain and monitor the first three categories**			
	Necessary information is not visible			
	All standards are not known and visible			
	Checklists do not exist for all cleaning and maintenance jobs			
	All quantities and limits are not easily recognizable			
	How many items cannot be locate in 30 seconds?			
Sustain	**Stick to the rules**			
	How many workers have not had 5S training?			
	How many times last week was daily 5S not performed			
	How many times are personal belongings not easily stored?			
	How many times are job aids not available or up to date?			
	How many times last week were daily 5S inspections not performed?			
	Total			

SANITATION CHECKLIST

- ❑ Are all worksites clean, sanitary and orderly?
- ❑ Are work surfaces kept dry and appropriate means taken to assure the surfaces are slip resistant?
- ❑ Are all spilled hazardous materials or liquids, including blood and other potentially infectious materials, cleaned up immediately and according to proper procedures?
- ❑ Is combustible scrap, debris and waste stored safely and removed from the worksite promptly?
- ❑ Is all regulated waste, as defined in the OSHA Bloodborne Pathogens standard (29 CFR 910.1030), discarded according to Federal, state and local regulations?
- ❑ Are accumulations of combustible dust routinely removed from elevated surfaces including the overhead structure of buildings, etc.?
- ❑ Is combustible dust cleaned up with a vacuum system to prevent suspension of dust particles in the environment?
- ❑ Is metallic or conductive dust prevented from entering or accumulating on or around electrical enclosures or equipment?
- ❑ Are covered metal waste cans used for oily or paint-soaked waste?
- ❑ Are all oil and gas-fired devices equipped with flame failure controls to prevent flow of fuel if pilots or main burners are not working?
- ❑ Are paint spray booths, dip tanks, etc., cleaned regularly?
- ❑ Are the minimum number of toilets and washing facilities provided and maintained in a clean and sanitary fashion?
- ❑ Are all work areas adequately illuminated?
- ❑ Are pits and floor openings covered or otherwise guarded?
- ❑ Have all confined spaces been evaluated for compliance with 29 CFR 1910.146? (Permit required confined spaces.)
- ❑ Are all work areas properly illuminated?
- ❑ Are employees instructed in proper first aid and other emergency procedures?
- ❑ Are hazardous substances, blood and other potentially infectious materials, which may cause harm by inhalation, ingestion, or skin absorption or contact, identified?
- ❑ Are employees aware of the hazards involved with the various chemicals they may be exposed to in their work environment, such as ammonia, chlorine,epoxies, caustics, etc.?

Planned Maintenance Checklist

Maintenance Activity	Frequency or Run Hours		Time Machine Shut Off for Service	Actual Maintenance Hours
	Monthly			
	Quarterly			
	Yearly			
	Monthly			
	Quarterly			
	Yearly			
	Monthly			
	Quarterly			
	Yearly			
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	Quarterly			
	Yearly			
	Monthly			
	Quarterly			
	Yearly			

Critical Spare Parts List						
Part Name	Part Number	Balance on Hand	Lead Time	Cost	Usage	Supplier

Lockout/Tagout Procedure

Dust Collector

In Case of Emergency Call 911
Also Notify the Maintenance Supervisor & Plant Manager

Ask the Maintenance Supervisor if there is a Service Manual Available.

SOURCES OF ENERGY:

• Electrical • Air

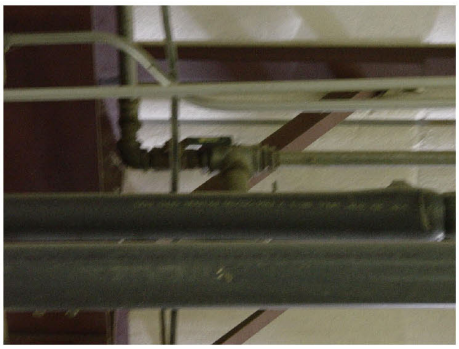
STEPS TAKEN TO SECURE MACHINES FROM ACCIDENTAL START-UP:

1. Notify Operator/Supervisor
2. Shut Off Start Switch
3. Locate and Isolate Energy Sources
4. VERIFY ISOLATION OF EQUIPMENT

ENERGY SOURCE	ISOLATION DEVICE	REMARKS
• Electrical	• Disconnect Box	• Main Blower
• Air	• Valve	• Shut off air from air assist • Panels, vacuum pressure • Valve, green, is inside the building







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by Maintenance Supervisor

LOCKOUT/TAGOUT CHECKLIST

- ❑ Is all machinery or equipment capable of movement required to be deenergized or disengaged and blocked or locked out during cleaning, servicing, adjusting, or setting up operations?
- ❑ If the power disconnect for equipment does not also disconnect the electrical control circuit, are the appropriate electrical enclosures identified and is a means provided to ensure that the control circuit can also be disconnectedand locked out?
- ❑ Is the locking out of control circuits instead of locking out main power disconnects prohibited?
- ❑ Are all equipment control valve handles provided with a means for locking out?
- ❑ Does the lockout procedure require that stored energy (mechanical, hydraulic, air, etc.) be released or blocked before equipment is locked out for repairs?
- ❑ Are appropriate employees provided with individually keyed personal safety locks?
- ❑ Are employees required to keep personal control of their key(s) while they have safety locks in use?
- ❑ Is it required that only the employee exposed to the hazard can place or remove the safety lock?
- ❑ Is it required that employees check the safety of the lockout by attempting a startup after making sure no one is exposed?
- ❑ Are employees instructed to always push the control circuit stop button prior to re-energizing the main power switch?
- ❑ Is there a means provided to identify any or all employees who are working on locked-out equipment by their locks or accompanying tags?
- ❑ Are a sufficient number of accident prevention signs or tags and safety padlocks provided for any reasonably foreseeable repair emergency?
- ❑ When machine operations, configuration, or size require an operator to leave the control station and part of the machine could move if accidentally activated, is the part required to be separately locked out or blocked?
- ❑ If equipment or lines cannot be shut down, locked out and tagged, is a safe job procedure established and rigidly followed?
- ❑ Are there procedures developed for multiple energy source pieces of equipment?

Appendix D to §1910.146 -- Sample Permits

Appendix D-1

CONFINED SPACE ENTRY PERMIT

Date and Time Issued:_____ Date and Time Expires: _____
Job site/Space I.D.: _____ Job Supervisor: _____
Equipment to be worked on: _____ Work to be performed:_____

Stand-by personnel: _____ _____ _____

1. Atmospheric Checks: Time _____
   Oxygen_____ %
   Explosive _____ % L.F.L.
   Toxic_____ PPM

2. Tester's signature: _____

3. Source isolation (No Entry):	N/A	Yes	No
Pumps or lines blinded,	( )	( )	( )
disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation only	( )	( )	( )

5. Atmospheric check after Isolation and Ventilation:

Oxygen _____	%	>	19.5	%
Explosive_____	% L.F.L	<	10	%
Toxic _____	PPM	<	10	PPM H(2)S
Time_____				

Tester's signature: _____

6. Communication procedures: _____
_____

7. Rescue procedures: _____
_____
_____
_____

8. Entry, standby, and back up persons:	Yes	No
Successfully completed required training?		
Is it current?	( )	( )

9. Equipment:	N/A	Yes	No
Direct reading gas monitor - tested	( )	( )	( )
Safety harnesses and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )
SCBA's for entry and standby persons	( )	( )	( )
Protective Clothing	( )	( )	( )
All electric equipment listed Class I, Division I, Group D and Non-sparking tools	( )	( )	( )

10. Periodic atmospheric tests:

Oxygen	____ %	Time ____	Oxygen	____%	Time ____
Oxygen	____ %	Time ____	Oxygen	____%	Time ____
Explosive	____ %	Time ____	Explosive	____%	Time ____
Explosive	____ %	Time ____	Explosive	____%	Time ____
Toxic	____ %	Time ____	Toxic	____%	Time ____
Toxic	____ %	Time ____	Toxic	____%	Time ____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor)_____

Approved By: (Unit Supervisor)_____

Reviewed By (Cs Operations Personnel) :

_____ _____

(printed name) (signature)

This permit to be kept at job site. Return job site copy to Safety Office following job completion.

Copies: White Original (Safety Office)
Yellow (Unit Supervisor)
Hard(Job site)

Sources: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9801
[58 FR 4549, Jan. 14, 1993; 58 FR 34846, June 29, 1993]

ENTRY PERMIT

PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

DATE: - - SITE LOCATION and DESCRIPTION _____

PURPOSE OF ENTRY _____

SUPERVISOR(S) in charge of crews Type of Crew Phone # _____

_____

_____

COMMUNICATION PROCEDURES _____

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) _____

_____

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-energize/Try-out	____	____
Line(s) Broken-Capped-Blanked	____	____
Purge-Flush and Vent	____	____
Ventilation	____	____
Secure Area (Post and Flag)	____	____
Breathing Apparatus	____	____
Resuscitator - Inhalator	____	____
Standby Safety Personnel	____	____
Full Body Harness w/"D" ring	____	____
Emergency Escape Retrieval Equip	____	____
Lifelines	____	____
Fire Extinguishers	____	____
Lighting (Explosive Proof)	____	____
Protective Clothing	____	____
Respirator(s) (Air Purifying)	____	____
Burning and Welding Permit	____	____

Note: Items that do not apply enter N/A in the blank.

**RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS

CONTINUOUS MONITORING**	Permissible _____								
TEST(S) TO BE TAKEN	Entry Level								
PERCENT OF OXYGEN	19.5% to 23.5%	___	___	___	___	___	___	___	___
LOWER FLAMMABLE LIMIT	Under 10%	___	___	___	___	___	___	___	___
CARBON MONOXIDE	+35 PPM	___	___	___	___	___	___	___	___
Aromatic Hydrocarbon	+ 1 PPM * 5PPM	___	___	___	___	___	___	___	___
Hydrogen Cyanide	(Skin) * 4PPM	___	___	___	___	___	___	___	___
Hydrogen Sulfide	+10 PPM *15PPM	___	___	___	___	___	___	___	___
Sulfur Dioxide	+ 2 PPM * 5PPM	___	___	___	___	___	___	___	___
Ammonia	*35PPM	___	___	___	___	___	___	___	___

* Short-term exposure limit: Employee can work in the area up to 15 minutes.
+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS: _____

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY PERSON(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

SUPERVISOR AUTHORIZING - ALL CONDITIONS SATISFIED_____

DEPARTMENT/PHONE _____

AMBULANCE ____ FIRE ____ Safety ____ Gas Coordinator ____

_____

Sources: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9801
[58 FR 4549, Jan. 14, 1993; 58 FR 34846, June 29, 1993]

HOT WORK PERMIT

BEFORE INITIATING HOT WORK, CAN THIS JOB BE AVOIDED?
IS THERE A SAFER WAY?

This Hot Work Permit is required for any temporary operation involving open flames or sparks. This includes, but is not limited to: brazing, cutting, grinding, soldering, thawing pipes, torch-applied roofing, and welding.

Date:

Building:

Location:

Description of hot work:

Name of Hot Work Operator:

Is a Fire Watch required?
_____Yes
_____No

A Fire Watch should be posted if

- combustible materials within a 35-foot radius of hot work cannot be removed
- wall or floor openings within a 35-foot radius of hot work expose combustible materials in adjacent areas, including concealed spaces in walls or floors
- combustible materials are adjacent to the opposite side of partitions, walls, ceilings or roofs and are likely to be ignited
- it is deemed necessary by the Permit Authorizing Individual

Permit Checklist

___ Flammable and combustible materials within a 35-foot radius of hot work have been removed or covered with fire retardant tarps or metal shields.

___ All floors and surfaces within a 35-foot radius of the hot work area have been swept free of combustible dust or debris.

___ Any openings or cracks in the walls, floors, or ducts that are potential travel passages for sparks, heat and flames have been covered.

___ An operable fire extinguisher is nearby and accessible.

___ Sprinkler heads that could be activated by hot work have been covered with a wet rag.

___ Smoke detectors in the area of hot work have been covered to prevent false alarms.

___ A Fire Watch has been posted, if it is required, during hot work operations and for 30 minutes after work has been completed.

AUTHORIZATION: The information on this permit has been evaluated, the site has been examined and all safety measures are in place.

Signed: _____
Permit Authorizing Individual

Source: www.ehs.iastate.edu

WARNING!

HOT WORK IN PROGRESS
WATCH FOR FIRE!

The permit valid until: _____

If you have questions about these hot work activities:

CALL: _____
AT: _____
_____
_____

WARNING!

CHECKLIST FOR ENTERING CONFINED SPACES

- ☐ Have all confined spaces been evaluated for compliance with 29 CFR 1910.146? (Permit required confined spaces)?
- ☐ Are confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry?
- ☐ Are all lines to a confined space that contain inert, toxic, flammable, or corrosive materials valved off and blanked or disconnected and separated before entry?
- ☐ Are employees aware of the potential hazards and trained in safe handling practices for situations involving various chemicals stored or used in the workplace such as acids, bases, caustics, epoxies, phenols, etc.?
- ☐ Are all impellers, agitators, or other moving parts and equipment inside confined spaces locked out if they present a hazard?
- ☐ Is either natural or mechanical ventilation provided prior to confined space entry?
- ☐ Are appropriate atmospheric tests performed to check for oxygen deficiency, toxic substances and explosive concentrations in the confined space before entry?
- ☐ Is adequate illumination provided for the work to be performed in the confined space?
- ☐ Is the atmosphere inside the confined space frequently tested or continuously monitored during work?
- ☐ When working in confined places, are environmental monitoring tests done and means provided for quick removal of employees in case of an emergency?
- ☐ Is there a trained and equipped standby employee positioned outside the confined space, whose sole responsibility is to watch the work in progress, sound an alarm if necessary and render assistance?
- ☐ Is the standby employee appropriately trained and equipped to handle an emergency?
- ☐ Are employees prohibited from entering the confined space without lifelines and respiratory equipment if there is any question as to the cause of an emergency?
- ☐ Has the employer determined whether hazards that require the use of PPE (e.g., head, eye, face, hand, or foot protection) are present or are likely to be present?
- ☐ Is approved respiratory equipment required if the atmosphere inside the confined space cannot be made acceptable?
- ☐ Is all portable electrical equipment used inside confined spaces either grounded and insulated or equipped with ground fault protection?

- [ ] Are compressed gas bottles forbidden inside the confined space?
- [ ] Before gas welding or burning is started in a confined space, are hoses checked for leaks, torches lighted only outside the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is taken into the confined space?
- [ ] If employees will be using oxygen-consuming equipment such as salamanders, torches, furnaces, etc., in a confined space, is sufficient air provided to assure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume?
- [ ] Whenever combustion-type equipment is used in a confined space, are provisions made to ensure the exhaust gases are vented outside of the enclosure?
- [ ] Is each confined space checked for decaying vegetation or animal matter which may produce methane?
- [ ] Is the confined space checked for possible industrial waste which could contain toxic properties?
- [ ] If the confined space is below ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?

Source: OSHA Handbook for Small Business

Glossary

55 System: a system designed to organize and standardize a workplace and consisting of five component parts: Sort, Set in Order, Shine, Standardize, and Sustain (see five component parts definitions).

55+1: a 5S system that includes Safety as the sixth component.

Acceptable Entry Conditions: the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Acute Effect: adverse effect on a human or animal that has severe symptoms developing rapidly and coming quickly to a crisis.

Acute Toxicity: acute effects resulting from a single dose of, or exposure to, a substance. Ordinarily used to denote effects in experimental animals.

Affected Employee: an employee who is required to use machines or equipment on which servicing is performed under the Lockout/Tagout standard or who performs other job responsibilities in an area where such servicing is performed

Air-Line Respirator: a respirator that is connected to a compressed breathable air source by a hose of small inside diameter. The air is delivered continuously or intermittently in a sufficient volume to meet the wearer's breathing requirements.

Air-Purifying Respirator: a respirator that uses chemicals to remove specific gases and vapors from the air or that uses a mechanical filter to remove particulate matter. An air-purifying respirator must only be used when there is sufficient oxygen to sustain life and the air contaminant level is below the concentration limits of the device.

Allergic Reaction: an abnormal physiological response to chemical or physical stimuli.

American National Standards Institute (ANSI): a privately funded, voluntary membership organization that identifies industrial and public needs for national consensus standards and coordinates development of such standards.

Anesthetic: a chemical that causes a total or partial loss of sensation. Overexposure to anesthetics can cause impaired judgment, dizziness, drowsiness, headache, unconsciousness and even death. Examples include alcohol, paint remover and degreasers.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Asphyxiant: a vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen). Most simple asphyxiants are harmful to the body only when they become so concentrated that they reduce oxygen in the air (normally about 21 percent) to dangerous levels (18 percent or lower). Asphyxiation is one of the principal potential hazards of working in confined and enclosed spaces.

Asymptomatic: showing no symptoms.

Atmosphere-Supplying Respirator: a respirator that provides breathable air from a source independent of the surrounding atmosphere. There are two types: air-line and self-contained breathing apparatus.

Attendant: an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

Authorized Employee: an employee who locks or tags machines or equipment in order to perform servicing or maintenance

Authorized Entrant: an employee who is authorized by the employer to enter a permit space

Auto-Ignition Temperature: the temperature to which a closed or nearly closed container must be heated in order that the flammable liquid, when introduced into the container, will ignite spontaneously or burn.

Blanking or Blinding: the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Boiling Points (BP): the temperature at which a liquid changes to a vapor state at a given pressure. The boiling point usually expressed in degrees Fahrenheit at sea level pressure (760 mmHg, or one atmosphere). For mixtures, the initial boiling point or the boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.

Bonding: the interconnecting of two objects by means of a clamp and bare wire. Its purpose is to equalize the electrical potential between the objects to prevent a static discharge when transferring a flammable liquid from one container to another. The conductive path is provided by clamps that make contact with the charged object and a low resistance flexible cable which allows the charge to equalize.

Capable of being locked out: an energy-isolating device is considered capable of being locked out if it is designed with a hasp or other means of attachment to which a lock can be affixed or has a locking mechanism built into it; can be locked without dismantling, rebuilding, or replacing the energy-isolating device or permanently altering its energy control capability.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Carcinogen: a substance or agent capable of causing or producing cancer in mammals, including humans. A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; or

(b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or

(c) It is regulated by OSHA as a carcinogen.

Carcinogenicity: the ability to produce cancer.

Ceiling Limit (PEL or TLV): the maximum allowable human exposure limit for an airborne substance which is not to be exceeded even momentarily. Also see PEL and TLV.

Changeover: when a piece of equipment has to stop producing in order to be fitted for producing a different item; for example, the installation of a different processing tool in a metal working machine, a different color paint in a painting system, a new plastic resin and mold in an injection molding machine, or loading different software

Chemical: an element (e.g., chlorine) or a compound (e.g., sodium bicarbonate) produced by chemical reaction.

Chemical Cartridge Respirator: a respirator that uses various chemical substances to purify inhaled air of certain gases and vapors. This type respirator is effective for concentrations no more than ten times the TLV of the contaminant, if the contaminant has warning properties (odor or irritation) below the TLV.

Chemical Transportation Emergency Center (CHEMTREC): a national center established by the Chemical Manufacturers Association (CMA) to relay pertinent emergency information concerning specific chemicals on requests from individuals. CHEMTREC has a 24-hour toll-free telephone number (800-424-9300) to help respond to chemical transportation emergencies.

Chronic Effect: an adverse effect on a human or animal body, with symptoms that develop slowly over a period of time or that recur frequently.

Chronic Exposure: long-term contact with a substance.

CO: carbon monoxide is a colorless, odorless, flammable and very toxic gas produced by the incomplete combustion of carbon. It is also a byproduct of many chemical processes. A chemical asphyxiant; it reduces the blood's ability to carry oxygen. Hemoglobin absorbs CO two hundred times more readily than it does oxygen.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

CO2: carbon dioxide is a heavy, colorless gas that is produced by the combustion and decomposition of organic substances and as a byproduct of many chemical processes. C02 will not burn and is relatively nontoxic (although high concentrations, especially in confined spaces, can create hazardous oxygen-deficient environments).

Code of Federal Regulations (CFR): a collection of the regulations that have been promulgated under United States Law.

Combustible: a term used by NFPA, DOT and others to classify certain liquids that will burn, on the basis of flash points. Both NFPA and DOT generally define "combustible liquids" as having a flash point of 100°F (37.8°C) or higher but below 200°F (93.3°C). Also see "flammable." Non-liquid substances such as wood and paper are classified as "ordinary combustibles" by NFPA.

Combustible Liquid: any liquid having a flash-point at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the total volume of which makes up ninety-nine (99) percent or more of the total volume of the mixture.

Concentration: the relative amount of a sub-stance when combined or mixed with other substances. Examples: 2 ppm hydrogen sulfide in air or a 50 percent caustic solution.

Confined Space: a space that: (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and (3) Is not designed for continuous employee occupancy.

Container: any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For purposes of the Right to Know program, pipes or piping systems are not considered to be containers.

Decomposition: breakdown of a material or substance (by heat, chemical reaction, electrolysis, decay or other processes) into parts or elements or simpler compounds.

Density: the mass (weight) per unit volume of a substance. For example, lead is much denser than aluminum.

Dilution Ventilation: air flow designed to dilute contaminants to acceptable levels. Also see general ventilation or exhaust.

Double Block and Bleed: the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Eight (8) Wastes: wastes addressed by Lean manufacturing that include overproduction, waiting, transportation, non-value added processing, excess inventory, defects, excess motion, arid underutilized people

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Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Emergency: any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Energized: machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy

Energy Source: any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy

Energy-Isolating Device: a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Engulfment: the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of this section.

Entry Supervisor: the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

Explosive: a chemical that causes a sudden, almost instantaneous release of pressure, gas and heat when subjected to sudden shock, pressure or high temperature.

Exposure or Exposed: state of being open and vulnerable to a hazardous chemical by inhalation, ingestion, skin contact, absorption or any other course; includes potential (accidental or possible) exposure.

Extinguishing Media: the firefighting substance to be used to control a material in the event of a fire; it is usually identified by its generic name, such as fog, foam, water, etc.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Eye Protection: recommended safety glasses, chemical splash goggles, face shields, etc. to be utilized when handling a hazardous material.

Flashpoint: the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite.

Fume: a solid condensation particle of extremely small diameter commonly generated from molten metal as metal fume.

General Exhaust: a system for exhausting air containing contaminants from a general work area.

Grounding: the procedure used to carry an electrical charge to ground through a conductive path. A typical ground may be connected directly to a conductive water pipe or to a grounding bus and ground rod.

Hand Protection: specific type of gloves or other hand protection required to prevent harmful exposure to hazardous materials.

Hazardous Atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes: (1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL); (2) Airborne combustible dust at a concentration that meets or exceeds its LFL; (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent; (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit; (5) Any other atmospheric condition that is immediately dangerous to life or health.

Hazardous Chemical: any chemical whose presence or use is a physical hazard or a health hazard.

Health Hazard: a chemical for which there is significant evidence, based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term “health hazard” includes chemicals that are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents that act on the hematopoietic system and agents that damage the lungs, skin, eyes or mucous membranes.

Hot Work Permit: the employer’s written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Ignitable: capable of being set afire.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Immediately Dangerous to Life or Health (IDLH): any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Incompatible: materials that could cause dangerous reactions by direct contact with one another.

Inerting: the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Ingestion: taking in by the mouth.

Inhalation: breathing in of a substance in the form of a gas, vapor, fume, mist or dust.

Isolation: the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Label: notice attached to a container, bearing information concerning its contents.

Lean: a systematic approach to identifying and eliminating waste (non-value added activities) through continuous improvement by flowing the product at the pull of the customer in pursuit of perfection.

Lean Enterprise: the organization that fully understands, communicates, implements, and sustains Lean concepts seamlessly throughout all operational and functional areas.

Line Breaking: the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Local Exhaust: a system for capturing and exhausting contaminants from the air at the point where the contaminants are produced (welding, grinding, sanding, other processes or operations).

Lockout: the placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed

Lockout Device: any device that uses positive means, such as a lock, blank flanges and bolted slip blinds, to hold an energy-isolating device in a safe position, thereby preventing the energizing of machinery or equipment

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Lower Explosive Limit or Lower Flammable Limit (LEL or LFL) of a vapor or gas: the lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present. At concentrations lower than the LEL, the mixture is too "lean" to burn.

Mean Time between Failure (MTBF): an indicator of expected system reliability calculated on a statistical basis from the known failure rates of various components of the system, usually expressed in hours; the measurement period divided by the number of failures that have occurred during the measurement period

Mean Time to Repair (MTTR): the total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time

Mechanical Exhaust: a powered device, such as a motor-driven fan or air steam venturi tube for exhausting contaminants from a workplace, vessel or enclosure.

Mechanical Filter Respirator: a respirator used to protect against airborne particulate matter like dusts, mists, metal fume, and smoke. Mechanical filter respirators do not provide protection against gases, vapors, or oxygen deficient atmospheres.

Motion Waste: any movement of people or machines that does not add value to the product or service

National Institute for Occupational Safety and Health (NIOSH), U.S. Public Health Service, U.S. Department of Health and Human Services (DHHS), among other activities, tests and certifies respiratory protective devices and air sampling detector tubes, recommends occupational exposure limits for various substances, and assists OSHA and MSHA in occupational safety and health investigations and research.

Neutralize: to eliminate potential hazards by inactivating strong acids, caustics and oxidizers. For example, acids can be neutralized by adding an appropriate amount of caustic substance to the spill.

Non-Permit Confined Space: a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Non-Sparking Tools: tools made from beryllium-copper or aluminum-bronze greatly reduce the possibility of igniting dusts, gases or flammable vapors. Although these tools may emit some sparks when striking metal, the sparks have a low heat content and are not likely to ignite most flammable liquids.

Non-Value Added: any activity that does not add market form or function or is not necessary. These activities should be eliminated, simplified, reduced, or integrated.)

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Normal Production Operations: utilization of a machine or equipment to perform its intended production function

OSHA: Occupational Safety and Health Administration, U.S. Department of Labor. Other Employees: all employees who are or may be in an area where energy control procedures may be utilized

Overall Equipment Effectiveness (OEE): a measure of how well an organization utilizes its equipment; OEE helps quantify the issues that relate to equipment losses

Overproduction: making more than is required by the next process, making earlier than is required by the next process, or making faster than is required by the next process

Oxidizer: a chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, causing fire either by itself or through the release of oxygen or other gases.

Oxygen Enriched Atmosphere: an atmosphere containing more than 23.5% oxygen by volume.

Parts per Million (ppm): the concentration of a gas or vapor in air-parts (by volume) of the gas or vapor in a million parts of air; also the concentration of a particulate in a liquid or solid.

Permissible Exposure Limit (PEL): an occupational exposure limit established by OSHA's regulatory authority. It may be a time-weighted average (TWA) limit or a maximum concentration exposure limit.

Permit System: the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Permit-Required Confined Space Program (permit space program): the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Physical Hazard: a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, an explosive, a flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Point of Operation: that point where work is performed on the material, such as cutting, shaping, boring or forming of stock must be guarded

Point of Use Storage (POUS): Raw material stored at the workstation where it is used.

Processing Waste: effort that adds no value to the product or service from the customers' viewpoint.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Prohibited Condition: any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Reaction: a chemical transformation or change; the interaction of two or more substances to form new substances.

Reactivity: chemical reaction with the release of energy. Undesirable effects--such as pressure buildup, temperature increase, formation of noxious, toxic or corrosive byproducts--may occur because of the reactivity of a substance to heating, burning, direct contact with other materials or other conditions in use or in storage.

Red Tag: a visible way to identify items that are not needed or in the wrong place.

Rescue Service: the personnel designated to rescue employees from permit spaces.

Respiratory Protection: devices that will protect the wearer's respiratory system from overexposure by inhalation to airborne contaminants. Respiratory protection is used when a worker must work in an area where he/she might be exposed to concentration in excess of the allowable exposure limit.

Respiratory System: the breathing system that includes the lungs and the air passages (trachea or "windpipe," larynx, mouth and nose) to the air outside the body, plus the associated nervous and circulatory supply.

Retrieval System: the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Routes of Entry: the means by which material may gain access to the body, for example, inhalation, ingestion and skin contact.

Self-Contained Breathing Apparatus: a respiratory protection device that consists of a supply or a means of respirable air, oxygen or oxygen-generating material carried by the wearer.

Sensitizer: a chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Servicing and/or Maintenance: workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, maintaining and/or servicing machines or equipment, including lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where employees could be exposed to the unexpected energization or startup of the equipment or release of hazardous energy

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Set in Order: step 2 of the 5S System. To identify the best location for remaining items, relocate out of place items, set inventory limits, and install temporary location indicators.

Shine: step 3 of the 55 System. To clean everything, inside and out and to continue to inspect items by cleaning them and to prevent dirt, grime, and contamination from occurring.

Skin Absorption: ability of some hazardous chemicals to pass directly through the skin and enter the bloodstream.

Sort: step 1 of the 58 System. To perform "Sort through and Sort out," by placing a red tag on all unneeded items and moving them to a temporary holding area. Within a predetermined time the red tag items are disposed of, sold, moved or given away. 'When in doubt, throw it out!"

Specific Gravity: the weight of a material compared to the weight of an equal volume of water is an expression of the density (or heaviness) of a material. Insoluble materials with specific gravity of less than 1.0 will float in (or on) water. Insoluble materials with specific gravity greater than 1.0 will sink in water. Most (but not all) flammable liquids have specific gravity less than 1.0 and, if not soluble, will float on water--an important consideration for fire suppression.

Spill or Leak Procedures: the methods, equipment and precautions that should be used to control or clean up a leak or spill.

Splash-Proof Goggles: eye protection made of a non-corrosive material that fits snugly against the face and has indirect ventilation ports.

Standardize: step 4 of the 58 System. To create the rules for maintaining and controlling the first 35's and to use visual controls.

Standardized Work: operations safely carried out with all tasks organized in the bestknown sequence and using the most effective combination of resources (people, materials, methods, machines).

Supplied-Air Respirators: air line respirators of self-contained breathing apparatus.

Sustain: step 5 of the SS System. To ensure adherence to the 5S standards through communication, training, and self-discipline.

Tagout: the placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed

Tagout Device: any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device to indicate that the machine or equipment to which it is attached may not be operated until the tagout device is removed

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Target Organ Toxin: a toxic substance that attacks a specific organ of the body. For example, overexposure to carbon tetrachloride can cause liver damage.

Teratogen: a substance or agent, exposure to which by a pregnant female can result in malformations in the fetus.

Testing: the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Threshold Limit Value (TLV): a term used by ACGIH to express the airborne concentration of material to which nearly all persons can be exposed day after day without adverse effects. ACGIH expresses TLVs in three ways:

> **TLV-C:** the ceiling exposure limit--the concentration that should not be exceeded even instantaneously.
>
> **TLV-STEL**: the Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided the daily TLV-TWA is not exceeded).
>
> **TLV-TWA:** the allowable time-weighted average concentration for a normal 8-hour workday or 40-hour workweek.

Time-Weighted Average (TWA): exposure is the airborne concentration of a material to which a person is exposed, averaged over the total exposure time--generally the total workday (8 to 12 hours). Also see TLV.

Total Productive Maintenance (TPM): a systematic approach to the elimination of equipment downtime as a waste factor.

Toxic Substance: any substance that can cause acute or chronic injury to the human body, or which is suspected of being able to cause diseases or injury under some conditions. UEL, or UFL Upper explosive limit or upper flammable limit of a vapor or gas; the highest concentration (highest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present. At higher concentrations, the mixture is too “rich” to burn. Also see LEL.

Underutilized: the waste of not using people’s mental, creative, and physical skills and abilities.

Universal Precautions: treats all human blood and certain body fluids as if they are infectious.

Value: a product or service’s capability provided to a customer at the right time, at an appropriate price, as defined in each case by the customer.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

Value Added: any activity that increases the market form or function of the product or service these are things the customer is willing to pay for).

Value Added Time: time for those work elements that transform the product in a way the customer is willing to pay for.

Vapor: the gaseous form of a solid or liquid substance as it evaporates.

Vapor Density: the weight of a vapor or gas compared to the weight of an equal volume of air is an expression of the density of the vapor or gas. Materials lighter than air have vapor densities less than 1.0 (examples: acetylene, methane, hydrogen). Materials heavier than air (examples: propane, hydrogen sulfide, ethane, butane, chlorine, sulfur dioxide) have vapor densities greater than 1.0. All vapors and gases will mix with air, but the lighter materials will tend to rise and dissipate (unless confined). Heavier vapors and gases are likely to concentrate in low places--along or under floors, in sumps, sewers, manholes, trenches and ditches--where they may create fire or health hazards.

Visual Controls: simple signals that provide an immediate understanding of a situation or condition. They are efficient, self-regulating, and worker managed.

Waiting Waste: idle time created when waiting for anything in a manufacturing process.

Waste: any activity that consumes resources but creates no value for the customer.

Work Place Organization: a safe, clean, neat, arrangement of the workplace that provides a specific location for everything, and eliminates anything not required.

Sources: www.OSHA.gov and U.S. Department of Commerce
National Institute of Standards and Technology Lean Manufacturing

SANITATION & 5S+1 WORKPLACE ORGANIZATION QUIZ

1. Sanitation/General Hygiene Code only applies to foodservice companies.

   True or False

2. Sanitation procedures should (check all that apply)
   - ❑ identify cleaning tasks
   - ❑ address who will be performing the tasks
   - ❑ address when and how often they will be performing the task
   - ❑ identify what will be required to perform the task safely and effectively

3. List three typical sanitation hazards.

4. Utilizing proper personal protective equipment, such as safety footwear, can help prevent slips, trips and falls.

   True or False

5. Many sanitation and maintenance employees are injured due to chemical exposures or become ill due to long-term exposure.

   True or False

6. Material Safety Data Sheets (MSDS) are not required to be accessible to employees and do not need to be reviewed.

   True or False

7. What three pieces of information are required on a chemical hazard communication label?

8. The term Universal Precautions refers to the practice of treating all human blood and certain bodily fluids as if they are infectious.

   True or False

9. If a bodily fluid exposure occurs, the proper sequence of action is:
   1. Report the exposure
   2. Wash exposed area with soap and water
   3. Flush splashes to nose, mouth, or skin with water
   4. Irrigate eyes with water or saline
   5. Direct the worker to a healthcare professional

   True or False

10. Cleaning and inspecting is the first step in establishing a 5S+1 program.

    True or False

LOCKOUT/TAGOUT & TOTAL PRODUCTIVE MAINTENANCE (TPM) QUIZ

1. Lack of preventive maintenance on equipment causes many injuries in the manufacturing sector.

   True or False

2. Total Productive Maintenance is a process that creates an environment which extends the life cycle and productivity of equipment.

   True or False

3. Typical Equipment Related Hazards (check all that apply)

   ❑ Amputations

   ❑ Electrocution

   ❑ Hazardous atmospheres

   ❑ Fall hazards

   ❑ Struck by and caught in

   ❑ Burns, caused by heat, cold, electrical, chemical

4. The purpose of lockout/tagout is to prevent energy from accidentally being released while a machine or equipment is being serviced.

   True or False

5. The ultimate goal of lockout/tagout is the protection of equipment from damage.

   True or False

6. List three potential sources of energy.

7. An Isolating Device is a mechanical device that physically prevents the transmission or release of energy, including E-Stops.

   True or False

8. Every person working on the equipment shall have their own lock applied. Under normal circumstances, only the person who put on the lock shall be allowed to remove the lock.

   True or False

9. The process of operating the start controls, engaging levers, measuring voltage, inspecting lockout devices valves, disconnect switches, blades, piping systems in an area to make sure that all energy sources have been isolated and controlled is known as VERIFICATION.

   True or False

10. Failure to follow lockout/tagout procedures could be FATAL for yourself and a coworker.

    True or False

CONFINED SPACE QUIZ

1. A confined space is large enough to enter, has limited entry/exit, and is not intended for continuous employee occupancy.
   True or False

2. The difference between a permit required and non-permit confined space is that it contains or has the potential to contain a serious safety or health hazard.
   True or False

3. Check potential hazards of confined spaces (check all that apply).
   _____ Atmospheric (air quality) hazards
   _____ Engulfment hazards
   _____ Environmental hazards
   _____ Noise, wet surfaces, falling objects
   _____ Configuration hazard
   _____ Dangerous combinations

4. The minimum acceptable oxygen level is 17%.
   True or False

5. List three potential sources of ignition.

6. Check possible causes of toxic atmospheres (check all that apply).
   _____ Presence of a flammable gas or vapor
   _____ Gases created by cleaning or a process
   _____ Material residue of stored material
   _____ Decomposition of materials
   _____ Sources near the confined space

7. List three examples of work performed in a confined space that can cause a hazardous atmosphere.

8. Permit-required confined space entrants are required to perform one test of the atmosphere.
   True or False

9. Written confined space entry permits require the signature of the entry supervisor as well as a signature of the person performing the air testing.
   True or False

10. The primary objective of the worker assigned to remain outside the confined space is to monitor activities taking place near the opening.
    True or False

IMEC Susan Harwood Training Grant
COURSE AND INSTRUCTOR EVALUATION

Training Title:		Training Date(s):	
Instructor:			

*To help us better meet the needs of small businesses, please respond to each of the following questions by checking the box that best describes your impression of this course according to the scale as follows: **1** being the **lowest** rating on the scale and 5 being the **highest**, or most favorable impression of the quality of this course.*

	Course Content	Very Poor	Poor	Neutral	Good	Very Good
	Using the scale, please rate how effective this training was in reference to the following:	**1**	**2**	**3**	**4**	**5**
1	Invoking a challenging and thought provoking experience					
2	Relevance and applicability to your position					
3	Setting clear course objectives and outline					
4	Class flow in terms of structure and orientation					
5	Instructor's methods of conveying information					
6	Quality and usefulness of materials provided					
7	Applicability of utilizing reference materials and/or follow-up exercises in your position					
8	Usefulness of activities and exercises in building your skills					
9	*How would you rate your overall satisfaction with the delivery and content of this course*					
10	Would you recommend this training to others	Yes ❒			No ❒	

	Instructor's Performance	Very Poor	Poor	Neutral	Good	Very Good
	Using the scale, please rate how effective the instructor's performance was in reference to the following:	**1**	**2**	**3**	**4**	**5**
11	Communicate concepts (understandability)					
12	Utilization of instructional handouts and/or presentation slides (PowerPoint, flip charts, etc.)					
13	Ability to maintain classroom enthusiasm					
14	Initiate or encourage class participation					
15	Provide constructive feedback					
16	Observe participants' needs in regards to breaks, questions, clarification, pace, etc.					
17	Response to questions during breaks					
18	Ability to incorporate examples applicable to work					
19	Demonstrate knowledge over the subject matter					

Comments: **Please feel free to offer any comments you may have regarding this training. Your feedback is greatly appreciated.**

Would you be interested in receiving more training in this area?	Yes ❒	No ❒