RENEWABLE FUELS ASSOCIATION

TECHNICAL GUIDANCE

Plant and Employee Safety Regulatory Requirements Overview For Fuel Ethanol Production Facilities

TABLE OF CONTENTS

OVERVIEW

At the request of the Renewable Fuels Association (RFA), this document was developed by ERI Solutions, Inc. of Colwich, KS to outline the general plant and employee safety regulatory compliance requirements for the fuel ethanol production industry.

As manager and loss control service provider for the Ethanol Risk Management SPC, Ltd. insurance company, and as an environmental, health & safety, process safety and non-destructive testing and inspection service provider to the ethanol industry we feel it is important to have an outline of the general plant and employee safety regulatory requirements for the ethanol industry.

It should be noted that the following information is summary in nature and is not intended to be a comprehensive list of all regulatory compliance requirements as all individual and various jurisdictional requirements were not evaluated and included.

ERI Solutions, Inc. provides professional services to help clients eliminate avoidable risks and reduce or transfer unavoidable risks of employee injury, liability, property damage and regulatory non-compliance.

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MANAGEMENT COMMITMENT IN CREATING A STRONG SAFETY CULTURE

An effective safety and health program makes all the difference in preventing injuries and illnesses in the workplace. The result is lower accident-related costs. Other benefits include reduced absenteeism, lower turnover, higher productivity and improved employee morale. It's also the right thing to do.

If your team wants to reduce accidents, injuries, illnesses and their related costs, everyone must place as much emphasis on safety and health issues as they place on other core management issues, such as production, sales and quality control. To be most effective, safety and health must be balanced with, and incorporated with other core business processes.

"Safety First" may sound good, but in reality, safety should not be considered separately. Rather, it must become a basic value of your company. Change "Safety First" to "Safe production is our only standard." This emphasizes the idea that it's fine to produce as hard and as fast as possible, as long as it can be done safely.

An effective safety and health program at your facility must be based upon a strong safety and health culture. Developing this culture starts with management involvement and a demonstrated commitment to safety. It becomes obvious to employees rather quickly if management is truly committed to providing a safe and healthy workplace or if they are offering lip service only. Likewise, employees must also be committed to accepting personal responsibility for ensuring their own safety and health, and have a duty to protect the safety and health of others. Responsibility and accountability are required throughout the organization for an effective safety culture to exist.

Management Tools Which Show A Commitment To Safety
http://www.osha.gov/SLTC/etools/safetyhealth/mod4_tools_leadership.html

DESIGNATING A SAFETY REPRESENTATIVE

It is essential to designate an individual to act as a facility safety representative. Safety is the responsibility for everyone at the facility, but it will be necessary to have a contact person to answer safety questions, ensure OSHA compliance, coordinate the facility safety training program and implement effective safety and health tools at the facility.

It will help to hire an individual with an education or background in safety and health, but it is not essential. Numerous training and educational courses exist to train a willing and capable individual to become the facility safety representative. There are also many safety resources available including the OSHA website which includes actual regulations and standard interpretations of the regulations.

Safety and health consultants can also be utilized to supplement and assist a safety representative. Consultants can be utilized for such things as safety program development and updates, safety training, air monitoring and general OSHA compliance and Best Management Practices (BMPs) development.

A safety representative should be designated as quickly as possible after deciding to construct a new facility. Several safety issues and strategies must be addressed prior to a facility start-up. They include developing an emergency action plan and other key OSHA required programs, new employee orientation training and developing safety rules and policies specific to the new facility. Having a safety representative involved in the construction phase will ensure a much smoother transition when the site transitions to an operational facility. The safety representative should be involved in the Process Safety Management (see PSM under OSHA compliance) program that must be resolved prior to start-up. Some of these items include compiling Process Safety Information (PSI), the Process Hazard Analysis (PHA) and the Pre-Startup Safety Review (PSSR).

The facility safety representative should be the primary contact for coordination with local safety and EMS personnel. Other safety personnel in the ethanol industry and in the safety profession in nearby communities can be a great resource for overall development of safety programs and networking for new or inexperienced safety coordinators. Many communities have developed local area safety committees to develop communication lines between local Emergency Medical Services and local businesses, share the latest development in safety regulations and compare safety challenges and solutions in similar businesses.

Safety And Health Professional Associations
http://www.asse.org/
http://www.nsc.org

Occupational Safety And Health Administration (OSHA)
http://www.osha.gov/

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) COMPLIANCE

1) Recordkeeping (OSHA 1904)

The Occupational Safety and Health Act of 1970 (OSHA) requires covered employers to prepare and maintain records of occupational injuries and illnesses. OSHA also establishes requirements and criteria for reporting work-related injuries, illnesses, and fatalities. There are several changes that took effect January 1, 2015 with regard to recordkeeping. Those changes can be reviewed on the web page referenced below.

The OSHA 300 log is the form used to record work-related injuries, illnesses, and fatalities on an annual basis. The OSHA 300A Form "Summary of Work-Related Injuries and Illnesses" is required to be posted annually from February 1 to April 30 summarizing the previous year's information.

Recordkeeping Update
https://www.osha.gov/recordkeeping2014/index.html

Forms For Recording Work-Related Injuries And Illnesses
https://www.osha.gov/recordkeeping/RKforms.html

2) Walking/Working surfaces (OSHA Subpart D)

Establishes requirements concerning guarding floor & wall openings, stairs and ladders. OSHA requires the use of a guardrail system to protect workers from falls of 4' or more to lower levels.

Topic Page – Fall Protection | Link to Quick Card For Fall Protection In General Industry
https://www.osha.gov/SLTC/fallprotection/index.html

3) Exit routes (OSHA 1910.37)

Establishes requirements for the proper design and construction of exit routes. Requirements cover construction materials, opening dimensions, accessibility conditions and capacity.

Tool For Maintenance, Safeguards And Operation Features For Exit Routes
http://www.osha.gov/SLTC/etools/evacuation/egress.html

4) Emergency Action Plan (OSHA 1910.38)

An Emergency Action Plan (EAP) must be developed and include procedures for reporting emergencies, emergency evacuation, and for employees performing medical or rescue duties. OSHA also establishes requirements for alarm systems and training personnel on the EAP.

National Institute of Occupational Safety And Health (NIOSH) - Emergency Response Resources
http://www.cdc.gov/niosh/emres/

Fire & Explosion Training Matrix To Help Employers Reduce Risk From Potential Terrorist Activities
http://www.osha.gov/dep/fire-expmatrix/index.html

Interpretation Letter - Alarm System Requirements For Evacuation/Response
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20959

5) Fire Prevention Plan (OSHA 1910.39)

Establishes requirements for employers to identify flammable and combustible materials stored in the workplace and develop ways to control workplace fire hazards. Completing a fire prevention plan and training employees will reduce the probability that a workplace fire will occur or spread.

Fire Prevention Plan Tool
http://www.osha.gov/SLTC/etools/evacuation/fire.html

6) Occupational Noise Exposure (OSHA 1910.95)

Requires employers to identify if any employees are exposed to noise levels at 85 decibels or more over eight (8) working hours. A hearing conservation program must be implemented if it is determined that employees may be exposed to levels above this threshold.

Publication Summarizing Components Of A Hearing Conservation Program For General Industry
http://www.osha.gov/Publications/osha3074.pdf

National Institute of Occupational Safety & Health (NIOSH) - Noise And Hearing Loss Prevention
http://www.cdc.gov/niosh/topics/noise/

7) Flammable and Combustible Liquids (OSHA 1910.106)

Establishes requirements for the handling, storage and use of flammable and combustible liquids with a flash point below 200°F. Ethanol is considered a Class 1B flammable liquid (Flash point 73°F).

Office Of Training And Education - Flammable And Combustible Liquids
https://www.osha.gov/dte/library/flammable_liquids/flammable_liquids.html

8) Storage and Handling of Anhydrous Ammonia (NH3) (OSHA 1910.111)

Facilities that have anhydrous ammonia systems must comply with this standard. If the process contains over 10,000 pounds of anhydrous ammonia, OSHA 1910.119 also applies (see Process Safety Management (PSM) below).

E-Tool - Anhydrous Ammonia (NH3)
https://www.osha.gov/SLTC/etools/ammonia_refrigeration/index.html

9) Process Safety Management (PSM) (OSHA 1910.119)

The purpose of this standard is to prevent or minimize the consequences of a catastrophic release of toxic, reactive, flammable, or explosive chemicals. Since ethanol is considered a flammable liquid, ethanol production facilities are required to comply with this standard if they process or store over 10,000 pounds of ethanol. OSHA also lists threshold quantities for other highly hazardous chemicals that are covered under the PSM regulation. Other common chemicals in use at ethanol production facilities that may fall under PSM regulations are anhydrous (or aqueous) ammonia, hydrochloric acid, denaturant, and chlorine dioxide. This is not an all-inclusive list, but if you have these chemicals at your site, you should determine for sure whether or not you meet the threshold quantity for that specific chemical. The 14 elements to PSM are:

- Employee participation: Employers must develop a site specific written plan of action for employee participation and document how they involve employees in all aspects of PSM. Safety committees can be an effective ally in complying with this component.
- Process safety information: Information must be compiled on the hazards of the covered chemical (Safety Data Sheets (SDS) are a good tool for compliance), the technology of the process and the equipment in the process. The different types of process safety information an facility must have are: SDSs, piping and instrumentation diagrams (P&IDs), block flow diagram, mass/energy balance, process chemistry description, maximum intended inventory of all equipment, safe upper and lower operating limits for all major equipment (temperature, pressure, flow, composition), and an evaluation of the consequences of deviation from the limits, which can be handled via the Process Hazard Analysis (PHA).

- Process hazard analysis: A process hazard analysis (PHA) must be performed prior to facility start-up and revalidated at least every five years. A PHA must be performed by a team that has members with expertise in engineering and process operations, the process being evaluated and the method of PHA used. The most common PHA method used in the ethanol industry is a Hazard and Operability Study (HAZOP), so ensure your PHA leader has training and experience in leading HAZOP studies.
- Operating Procedures: Written operating procedures must be developed that provide instruction for safely conducting activities during all phases of operation including emergency operations. Procedures must include safe operating limits, safety and health considerations and safety systems and their functions. These procedures must be certified at least annually to ensure they are correct and accurate.
- Training: Each employee involved in the covered process must be trained in an overview of process safety management at your facility, the process and the operating procedures required above. Refresher training must be provided at least every three (3) years. Training must be documented and include the method used to verify the employee understood the training.
- Contractors: Employers must review a contractor's safety performance and programs prior to the contractor performing work in a covered process area. Contractors who do not influence process safety (e.g. delivery services) are not subject. The employer must inform the contractor of the hazards of the process and share the facility emergency action plan. The employer must also control the entrance, presence and exit of contractors in covered process areas. The contractor employer is responsible for training their personnel and documenting accordingly.
- Pre-Startup Safety Review (PSSR): A pre-startup safety review must be conducted prior to introducing a highly hazardous chemical into the process. This must be done for new facilities as well as existing facilities where there is a significant modification to the covered process that requires any update to process safety information.
- Mechanical Integrity: A mechanical integrity program must be in place to assure the continued integrity of process equipment. Elements of a mechanical integrity program include equipment identification (part of the process safety information), written procedures for inspecting and testing equipment that follows recognized and generally accepted good engineering practices (RAGAGEP), and training employees involved in maintenance activities. Since most ethanol production facilities were designed to API and ASME codes, those codes should be used to determine the frequency of inspection and testing. As a general outline, API 510, API 570, and API 653 should be used to evaluate your non-fired pressure vessels, process piping, and above ground storage tanks respectively. There are many other engineering guidelines available for pressure safety valves, field gauges, transmitters, safety systems, and other equipment covered in your process as well. The manufacturer of your equipment can be a valuable resource as well.
- Hot Work: Hot work is defined as "work involving electric or gas welding, cutting, brazing, or similar flame or spark-producing operations". Hot work permits must be developed and utilized for hot work operations conducted on or near the covered process.
- Management Of Change (MOC): The employer must establish written procedures to manage change (except for "replacements in kind" defined as "a replacement which satisfies the design specification"). You must have thorough documentation of your process safety information before you can determine if your changes are "replacement in kind". Changes to process chemicals, technology, equipment and procedures must be covered in this procedure. Temporary changes are also subject to these requirements and must ensure equipment and procedures are returned to their original or designed condition at the end of the temporary change.
- Incident Investigation: Incidents which result in a release or could have resulted in a release of a hazardous chemical must be investigated by a team of individuals with appropriate knowledge and experience. Incidents must be investigated as soon as possible, but no later than 48 hours after the incident. All incident root cause and corrective actions should be shared with all members of your facility as part of the employee participation plan.
- Emergency Response and Planning: (see OSHA 1910.38 – Section 4 of this manual, and 1910.120 – Section 10 of this manual)

- Compliance Audits: PSM audits must be conducted to evaluate all 14 elements at least every three years. OSHA currently encourages all PSM compliance audits be conducted by a third party. This suggestion is one of the many proposed changes to the PSM standard currently under review – it is likely to become mandatory in the near future. The employer must determine an appropriate response to the audit findings and document that all deficiencies have been corrected. Once again, sharing these findings and associated corrective actions with all employees is a perfect opportunity to include as part of employee participation activities.
- Trade secrets: Employees are allowed access to trade secret information contained within the PHA or other documents required by the PSM standard. The employer can require employees to enter into confidentiality agreements.

Compliance Guidelines And Recommendations For Process Safety Management (PSM)
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9763

Interpretation Letter - OSHA Enforcement Policy For Distilleries And Related Industries
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=24501

10) Emergency Response (OSHA 1910.120)

Employers must address what action employees are to take when there is an unwanted release of hazardous chemicals. Employers may decide to train and mobilize employees to control or mitigate the release according to the requirements of 1910.120 the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard. Employers may also decide to have employees evacuate the danger area and have local community emergency response organizations respond to the release.

HAZWOPER Flow Chart
http://www.osha.gov/dep/ohe/application_worksiteresponse.html

Interpretation Letter - Petroleum Products And HAZWOPER
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20338

Interpretation Letter - Off-Shift Emergency Response Capabilities And Training Requirements
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21177

Interpretation Letter - Incidental Spill And Necessary Training Required For Personnel Performing Clean-up
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20052

Fact Sheet – HAZWOPER Training Levels
https://www.osha.gov/OshDoc/data_General_Facts/factsheet-hazardouswaste.pdf

11) Personal Protective Equipment (PPE) (OSHA Subpart I)

Contains regulations for Personal Protective Equipment (PPE) selection and use concerning eyes, face, head and extremities. All ethanol production facilities must perform and document a workplace hazard assessment so the proper PPE can be designated and communicated for all areas of your facility.

Respiratory Protection Standard
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716

National Institute of Occupational Safety & Health (NIOSH) - Respirators
http://www.cdc.gov/niosh/topics/respirators/

Compliance Guidelines – Hazard Assessment And Personal Protective Equipment (PPE) Selection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10120

OSHA Personal Protective Equipment Publication
https://www.osha.gov/Publications/osha3151.pdf

OSHA Publication – Personal Protective Equipment Payment Standard
https://www.osha.gov/Publications/PPE-factsheet-final.pdf

OSHA Bulletin – General Respiratory Protection Guidance for Employers and Workers
https://www.osha.gov/dts/shib/respiratory_protection.pdf

OSHA E-Tool – Respiratory Protection
https://www.osha.gov/SLTC/etools/respiratory/index.html

Compliance Guidelines – Hazard Assessment And Personal Protective Equipment (PPE) Selection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10120

12) Permit Required Confined Spaces (OSHA 1910.146)

Requires employers to develop practices and procedures to protect employees working in permit-required confined spaces (PRCS). The standard requires an evaluation to determine the existence of PRCSs, the implementation of a written confined space program, and the establishment of rescue/emergency procedures. The employer must decide either to train employees on entry rescues or rely on available external sources to provide entry rescues. Either method must be documented as to it's availability and reliability to respond in the event of an emergency. All PRCSs must be labeled or communicated according to the requirements of the standard.

National Institute of Occupational Safety & Health (NIOSH) - Confined Spaces
http://www.cdc.gov/niosh/topics/confinedspace/

OSHA Publication – Permit Required Confined Spaces
https://www.osha.gov/Publications/osha3138.pdf

13) Lockout/Tagout (OSHA 1910.147)

Requires implementing practices and procedures to shut down equipment, isolate it from energy sources and prevent the release of potential hazardous energy while maintenance and service activities are being performed. Employers must develop and document specific procedures for all equipment and machinery that may be serviced within their facility.

Lockout/Tagout Interactive Training Program
https://www.osha.gov/dts/osta/lototraining/index.html

Interpretation Letter - Developing Separate Procedures For Each Piece Of Equipment/Annual Audit Guidelines
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21936

14) Medical Services and First Aid (OSHA 1910.151)

Employers must ensure that medical personnel and adequate first aid supplies are available to workers to handle potential workplace injuries if a medical facility is not in near proximity to the workplace.

Interpretation Letter - "In Near Proximity"
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21398
Interpretation Letter - First Aid And Trained Personnel
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22314
Interpretation Letter - First Aid Supplies
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=24118

15) **Fire Protection (OSHA Subpart L)**
Standards for portable fire extinguishers, fire brigades, employee alarm systems, automatic sprinkler systems and fixed extinguishing systems.

1910.156 - Standard For Fire Brigades
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9810

1910.157 - Standard For Portable Fire Extinguishers
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9811

1910.165 - Standard For Employee Alarm Systems
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9819

Compliance Tool - Evacuation Plans And Procedures With Regards To Alarm Systems
https://www.osha.gov/SLTC/etools/evacuation/alarms.html

Interpretation Letter - Use of Alternative Alarm Methods
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21808

16) **Powered Industrial Trucks (OSHA 1910.178)**
Establishes requirements for powered industrial trucks and training requirements for operators of powered industrial trucks.

Training Materials For Powered Industrial Trucks
https://www.osha.gov/SLTC/etools/pit/assistance/index.html

17) **Machinery and Machine Guarding (OSHA 1910.212)**
General requirements for machine guarding.

Compliance Tool - Methods Related To Machine Guarding
http://www.osha.gov/SLTC/etools/machineguarding/generalrequirements.html

18) **Welding, Cutting and Brazing (OSHA Subpart Q)**
Contains regulations for oxygen fuel cutting and welding, arc welding and cutting, and resistance welding. The standards also contain training requirements for personnel who will be performing welding, cutting or brazing.

19) Grain Handling (OSHA 1910.272)

Contains requirements for control of grain dust fires or explosions and other hazardous associated with grain handling facilities.

Compliance Directive For Inspection Of Grain Handling Facilities
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=1535

Combustible Dust In Industry - Preventing And Mitigating The Effects Of Fire And Explosions
http://www.osha.gov/dts/shib/shib073105.html

20) Electrical (OSHA Subpart S)

Contains regulations regarding electrical hazards in the workplace. Subpart S is based on older versions of the national consensus standard NFPA 70E. OSHA has proposed an update to Subpart S to reflect the more current editions of NFPA 70E.

OSHA Proposed Subpart S
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=18100

OSHA 1910.303 General Electrical
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9880

OSHA 1910.307 Hazardous (Classified) Locations
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9884

NOTE: OSHA 1910.307 applies to grain handling facilities where dust (Class II hazardous location) can accumulate as well as ethanol (Class I hazardous location) facilities

OSHA 1910.399 Definitions Related To Hazardous (Classified) Locations
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9976

21) Access to Employee Exposure and Medical Records (OSHA 1910.1020)

This standard is triggered if an employee is exposed to toxic substances or harmful physical agents in the workplace. These exposure and medical records must be retained in accordance with this regulation. The records must also be made available to employees or their designated representative.

Booklet Explaining Access To Exposure And Medical Records For Employees
http://www.osha.gov/Publications/pub3110text.html

Interpretation Letter - Employee Rights To Access Medical Records Including Drug Tests
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22793

22) Bloodborne Pathogens (OSHA 1910.1030)

This standard applies to all possible occupational exposure to blood or other potentially infectious materials (OPIM). Occupational exposure means reasonably anticipated contact with blood or other potentially infectious materials that may result from performance of an employee's duties. Employees who are responsible for rendering first aid or medical assistance as part of their job duties are covered by the protections of the standard.

Frequently Asked Questions (FAQs) - Bloodborne Pathogens Standard
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21010

23) Hazard Communication (OSHA 1910.1200)

Also referred to as the "Right-to-Know" standard, Hazard Communication establishes requirements for ensuring that chemical hazards and their associated protective measures are disseminated to employees who could be potentially be affected by these hazards.

Hazardous Communication / Global Harmonized System Of Classification And Labeling Of Chemicals (GHS)
https://www.osha.gov/dsg/hazcom/index.html

24) Occupational Exposure to Hazardous Chemicals in Labs (OSHA 1910.1450)

This standard requires a laboratory to develop a Chemical Hygiene Plan which addresses specific hazards found in the laboratory. This standard does not apply to typical facility laboratory, as they generally only perform quality assurance/quality control type laboratory operations.

Regulation Applicability
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22745

OSHA Safety And Health Topic On Laboratories
http://www.osha.gov/SLTC/laboratories/index.html

25) OSHA Section 5(a)(1) General Duty Clause

Requires each employer to furnish to each of his employees a place of employment which is free from recognized hazards that could cause or that are likely to cause death or serious physical harm to his employees.

Occupational Safety And Health Administration (OSHA) Website
http://www.osha.gov/

29 CFR 1910 - OSHA General Industry Standard
https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=1&p_keyvalue=1910

TRAINING

1) **New Employee Safety Training & Orientation**
   New employees must be trained to safely perform their job function. New employee training should focus on safety rules and programs as well as the hazards they may encounter while working at the facility. It is recommended (and required in most instances) to verify that the employee understands the training they have received e.g. a written test.

2) **Employee Refresher Training**
   Employers must provide refresher training based on several factors. OSHA requires specific timeframes for refresher training in several standards. Employers must also implement refresher training after an incident, near miss or an inspection/audit indicates that current training is not adequate.

3) **Contractor Safety Training**
   Employers must ensure that contractors that will be performing work at their facility are properly trained in the applicable facility safety rules, applicable safety programs such as the emergency action plan and made aware hazards they may encounter while working at the facility.

OSHA Training Requirements
http://www.osha.gov/Publications/2254.html

OSHA Training And Reference Material Library
https://www.osha.gov/dte/index.html

SAFETY AND HEALTH PROGRAM TOOLS

1) Permits

A permit should be utilized for work that is non-routine, where approval is needed, and where specific procedures have not been written. The following situations may require a permit to be performed:

- Confined Space Entry
- Line and Equipment Opening/Breaking
- Hot Work i.e. cutting and welding
- Trenching and Excavation
- Management of Change
- Energized Electrical Work
- High Work requiring fall protection

2) Job Hazard Analysis (JHA)

The purpose of a JHA is to provide a simple but thorough procedure to assure all potential hazards are identified and controlled prior to the start of work. The JHA should be completed at the work-site to help identify any potential hazards. If a crew is completing a JHA, each individual on the crew should contribute to ensure the JHA is complete.

OSHA Job Hazard Analysis Information
http://www.osha.gov/Publications/osha3071.html

3) Safety Committees

Safety committees are a key part in establishing a culture of safety in the workplace. Safety committees are an essential tool to identify workplace hazards and offer viable solutions. They can provide a sounding board by being a visible and approachable body for safety or health complaints and suggestions. Some states mandate a safety committee under state labor laws.

4) Incident/Near Miss Reporting and Investigation

A culture should be created that places emphasis on reporting near misses regardless if no injury or property damage occurs. Research has indicated that for every serious injury, there are greater than 600 near misses that occur. It is essential that all workplace incidents and near misses be reported as soon as possible. A thorough investigation of the incident should be initiated to determine the immediate cause of the incident and the underlying basic causes of the incident. Recommendations can then be made to eliminate the basic causes and prevent similar incidents from happening again.

OSHA Information Regarding Incident Investigations
https://www.osha.gov/dcsp/products/topics/incidentinvestigation/index.html

5) Facility Inspections and Audits

A periodic inspection and audit system should be utilized to monitor the effectiveness of a facility's safety program. Inspections can be conducted internally or externally utilizing safety consultants, insurance representatives or even OSHA consultants. Process Safety Management audits must be performed at least every three years by a person who is not affiliated with the facility.

OSHA Self-Inspection Checklists
https://www.osha.gov/Publications/smallbusiness/small-business.html#check

OSHA Consultation Program
http://www.osha.gov/dcsp/smallbusiness/consult.html

6) Industrial Hygiene Monitoring

Industrial hygiene surveys are conducted to accurately assess potential worker exposures to chemical, physical and biological agents in the workplace and to provide recommendations for their control, as needed. After baseline evaluations, periodic workplace evaluations are made to assure the effectiveness of the implemented controls and determine the need for continued medical surveillance.

OSHA's Office of Training and Education Publication – Industrial Hygiene
https://www.osha.gov/dte/library/industrial_hygiene/industrial_hygiene.pdf

The potential for many chemical stressors exists in the (un)loading, processing, operational, and laboratory areas as well as certain maintenance activities. Examples include: respirable dusts, organic chemical such as alcohols, corrosives, and welding fume (general metal fumes and hexavalent chromium). All ventilation systems such as laboratory hoods must be tested periodically in order to ensure the proper flowrate and capture of chemicals.

OSHA 1910.1000 – Toxic and Hazardous Substances – Air Contaminants
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9991

OSHA Safety & Health Topics – Chemical Hazards and Toxic Substances
https://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html

For temperature related stress evaluation, meters are available that take into account variables such as the different types of heat involved, protective clothing worn (FRC), and task performed. From this, proper controls can be implemented to reduce exposure to acceptable levels.

OSHA Resource – Heat Illness Prevention
https://www.osha.gov/SLTC/heatillness/index.html

OSHA Resource – Winter Weather Preparedness
https://www.osha.gov/dts/weather/winter_weather/index.html

7) Safety Management Systems

A typical safety management system may include pieces of various proven management systems such as ISO 14000, OHSAS 18000 (Soon to be ISO 45000) or OSHA's Voluntary Protection Program, Not only does a management system help to ensure compliance with all known regulatory requirements, it puts a structure in place to ensure success can continue in tough situations such as staffing changes.

Making a decision to voluntarily implement a Safety Management system ahead of regulatory recommendation or requirement is very well received by regulators should they ever be on-site due to an incident or inspection.