# OSHA Process Safety Management

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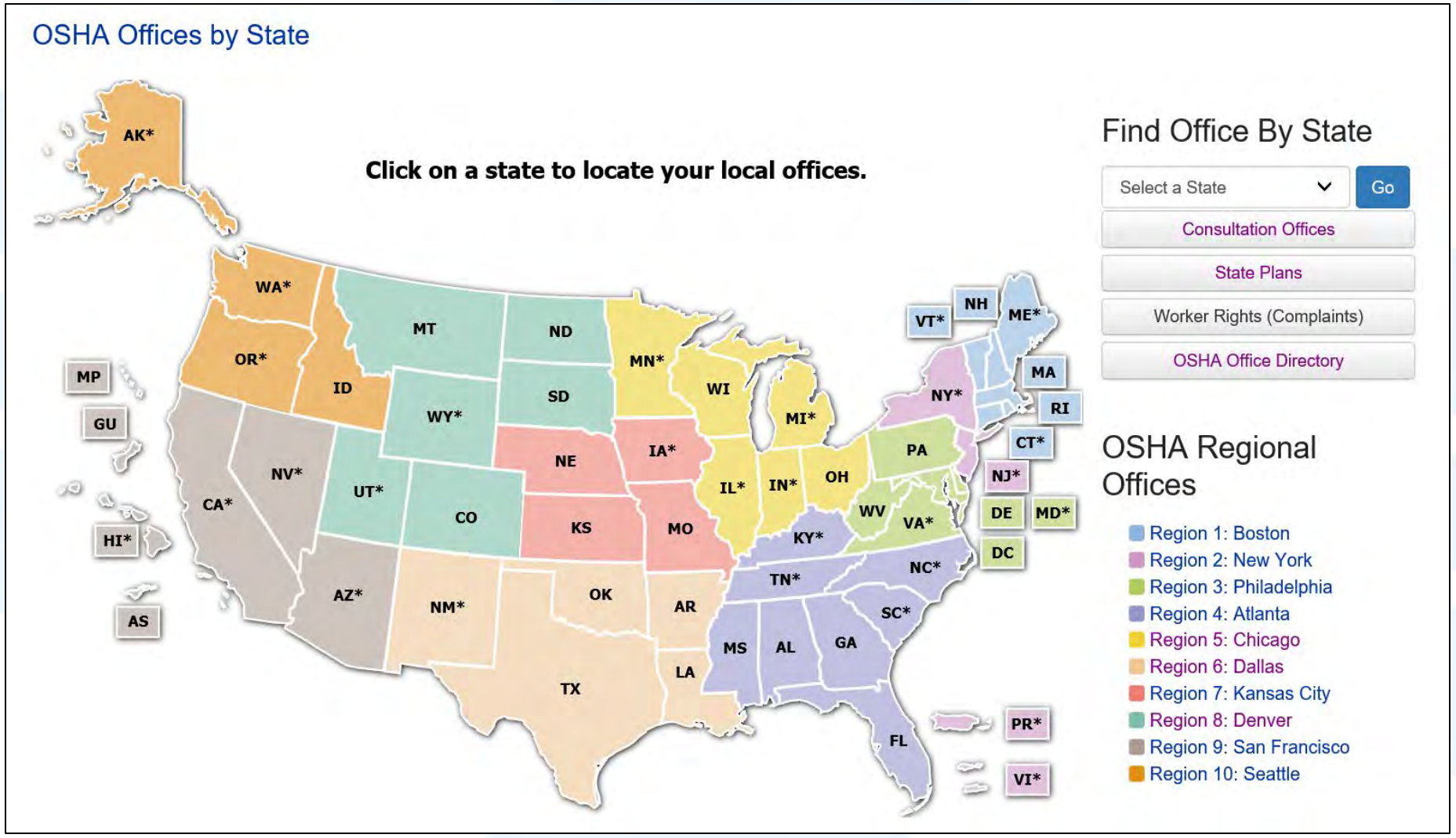
# Find an OSHA Office




https://www.osha.gov/contactus/bystate

# What Can We Expect?

- What is PSM?
- Emphasis programs and inspection procedures
- Common citations/hazards
- Compliance assistance resources
- Process Safety Management Standard
- Questions

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# What is PSM?

- 29 CFR 1910.119:
  - Requirements for safe management of hazards associated with processes using, storing, manufacturing, or handling highly hazardous chemicals.
  - Emphasizes management of hazards through comprehensive program that integrates established technologies, procedures and practices

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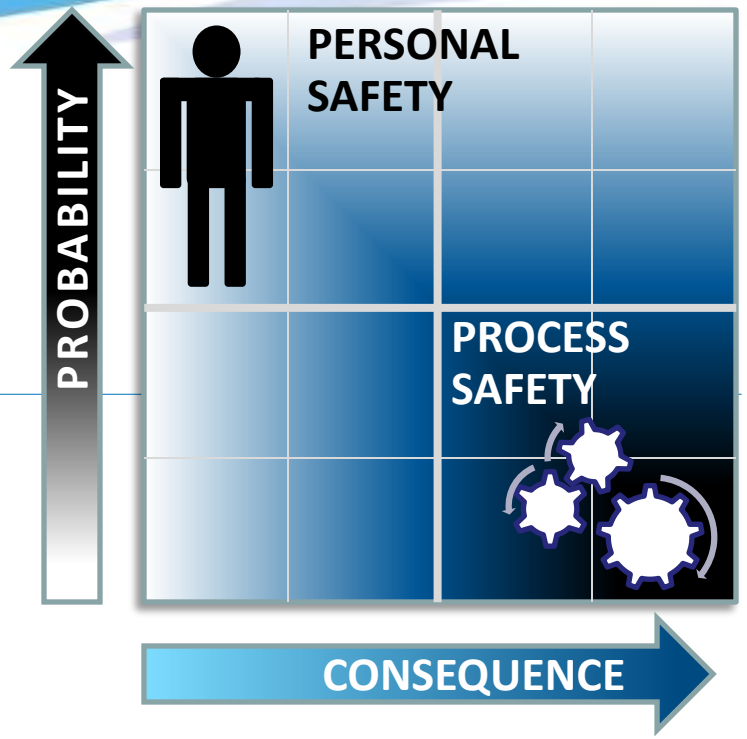
# Personal Safety vs. PSM

- **PROCESS SAFETY** incidents are low probability/ high consequence events.
- Conversely, **PERSONAL SAFETY** incidents tend to arise from higher probability/ lower consequence events.
- Process safety requires a strong **MANGEMENT SYSTEMS** approach to identify and control hazards.

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# PSM History

- Years of unexpected releases of toxic, reactive or flammable liquids and gases in processes involving highly hazardous chemicals
- Incidents/disasters resulting in death and injury
- Proposed standard published 1990
- Clean Air Act Amendments enacted 1990
- Final Rule issued 1992

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# What is covered?

- Processes including:
  - 10,000 pounds of flammable liquids or gasses
  - Threshold quantity (TQ)of a highly hazardous chemical (HHC)
    - 130+ chemicals listed in Appendix A
    - Toxic and/or reactive chemicals

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# Appendix A

| CHEMICAL NAME | CAS* | TQ** |
|---|---|---|
| Acetaldehyde | 75-07-0 | 2500 |
| Acrolein (2-Popenal) | 107-02-8 | 150 |
| Acrylyl Chlorde | 814-68-6 | 250 |
| Allyl Chlorid | 107-05-1 | 1000 |
| Allylamine | 107-11-9 | 1000 |
| Alkylaluminum | Varies | 5000 |
| Ammonia, Anhydrous | 7664-41-7 | 10000 |
| Ammonia solutions (greater than 44% ammonia by weight) | 7664-41-7 | 15000 |
| Ammonium Perchlorate | 7790-98-9 | 7500 |
| Ammonium Permanganate | 7787-36-2 | 7500 |

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# What is covered?

- Example: Ammonia
  - TQ > 10,000 pounds for anhydrous (gas) ammonia
  - Mostly used in refrigeration

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# What isn’t covered?

- Retail facilities
- Oil or gas well drilling or servicing operations
- Normally unoccupied remote facilities
- Hydrocarbon fuels used solely for workplace consumption (ie vehicle refueling)
- Flammable liquids with flash point below 100F and stored in atmospheric tanks and kept below boiling point without refrigeration

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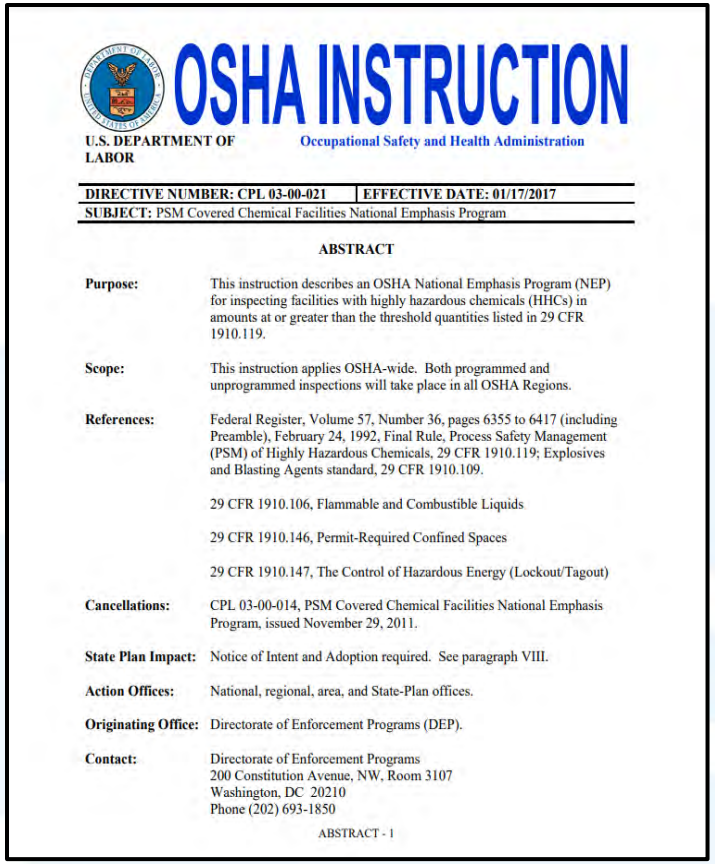
# FY 21 National Emphasis Programs

- Amputations in Manufacturing
- Lead Exposures (GI and Construction)
- Federal Agency Targeting Inspection Program
- Hexavalent Chromium Exposures
- PSM Covered Chemical Facilities
- Combustible Dust
- Trenching and Excavation
- Primary Metals Industries (Foundries)
- Shipbreaking
- Respirable Crystalline Silica
  https://www.osha.gov/dep/neps/nep-programs.html



OSHA INSTRUCTION

U.S. DEPARTMENT OF LABOR — Occupational Safety and Health Administration

| DIRECTIVE NUMBER: CPL 03-00-021 | EFFECTIVE DATE: 01/17/2017 |
|---|---|
| SUBJECT: PSM Covered Chemical Facilities National Emphasis Program | |

ABSTRACT

**Purpose:** This instruction describes an OSHA National Emphasis Program (NEP) for inspecting facilities with highly hazardous chemicals (HHCs) in amounts at or greater than the threshold quantities listed in 29 CFR 1910.119.

**Scope:** This instruction applies OSHA-wide. Both programmed and unprogrammed inspections will take place in all OSHA Regions.

**References:** Federal Register, Volume 57, Number 36, pages 6355 to 6417 (including Preamble), February 24, 1992, Final Rule, Process Safety Management (PSM) of Highly Hazardous Chemicals, 29 CFR 1910.119; Explosives and Blasting Agents standard, 29 CFR 1910.109.

29 CFR 1910.106, Flammable and Combustible Liquids

29 CFR 1910.146, Permit-Required Confined Spaces

29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)

**Cancellations:** CPL 03-00-014, PSM Covered Chemical Facilities National Emphasis Program, issued November 29, 2011.

**State Plan Impact:** Notice of Intent and Adoption required. See paragraph VIII.

**Action Offices:** National, regional, area, and State-Plan offices.

**Originating Office:** Directorate of Enforcement Programs (DEP).

**Contact:** Directorate of Enforcement Programs
200 Constitution Avenue, NW, Room 3107
Washington, DC 20210
Phone (202) 693-1850

ABSTRACT - 1

Download PSM Program

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# PSM Covered Chemical Facilities NEP

- Four targeting categories (Category 1-4)
  - Ammonia refrigeration
  - Petroleum Refineries (NAICS 32411 or 324110)
  - Chemical mfg facilities (NAICS 325)
  - Other (likely PSM facilities)

- Since 2010
  - 69 significant enforcement cases in chemical facilities
  - 24 significant enforcement cases in refineries

# PSM Covered Chemical Facilities NEP

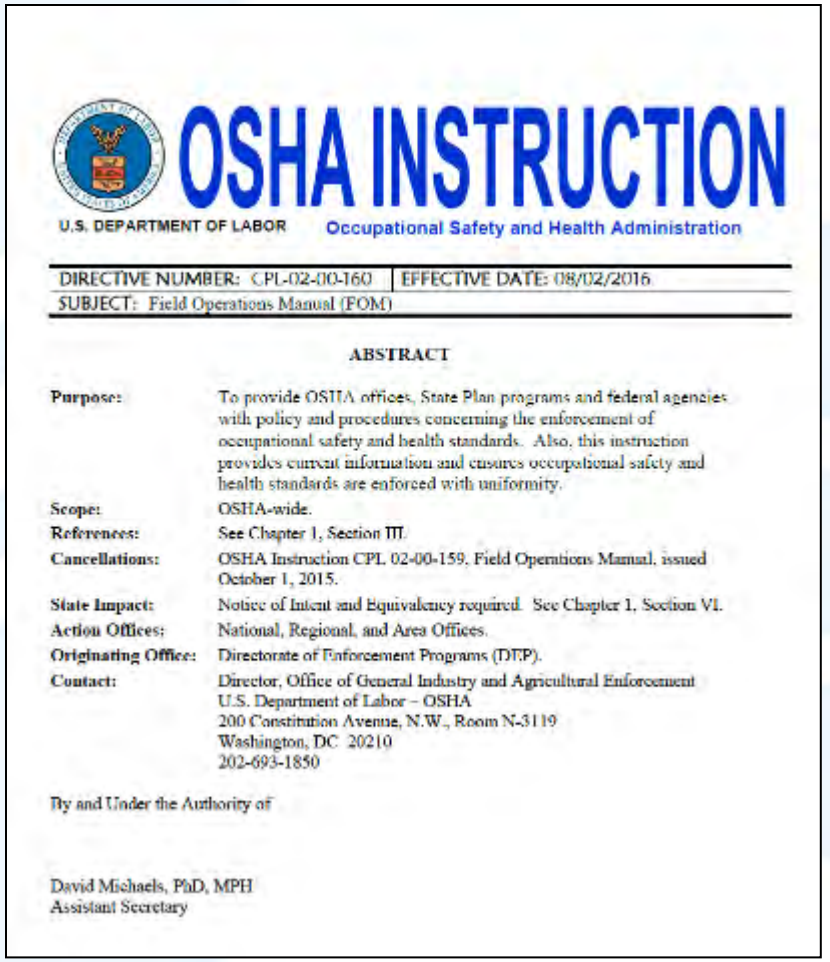
- Stresses implementation over documentation
- Qualifications for inspectors
- Inspection process outline
  - Discussion with facility management
  - Initial walkaround vs unit selection
  - Commonly requested documents (pre and post unit selection)
  - Dynamic questions
  - PPE

# The General Inspection Process

- No Notice
- Opening Conference
  - Present credentials and explain purpose and scope
  - Request Information, ask questions
- Walkthrough/Inspection
  - Visual inspection of facility
  - Audio/Visual Recording/ Photos/Measurements
  - Sampling (noise, inhalation hazards)
  - Employee Interviews (private and confidential)
- Closing Conference

# The Inspection Process

- Field Operations Manual (FOM)
- Instructions on:
  - Emphasis Programs
  - Inspections
  - Sampling
  - Citations
  - Post-Citation



OSHA INSTRUCTION

U.S. DEPARTMENT OF LABOR Occupational Safety and Health Administration

DIRECTIVE NUMBER: CPL-02-00-160 | EFFECTIVE DATE: 08/02/2016

SUBJECT: Field Operations Manual (FOM)

ABSTRACT

**Purpose:** To provide OSHA offices, State Plan programs and federal agencies with policy and procedures concerning the enforcement of occupational safety and health standards. Also, this instruction provides current information and ensures occupational safety and health standards are enforced with uniformity.

**Scope:** OSHA-wide.

**References:** See Chapter 1, Section III.

**Cancellations:** OSHA Instruction CPL 02-00-159, Field Operations Manual, issued October 1, 2015.

**State Impact:** Notice of Intent and Equivalency required. See Chapter 1, Section VI.

**Action Offices:** National, Regional, and Area Offices.

**Originating Office:** Directorate of Enforcement Programs (DEP).

**Contact:** Director, Office of General Industry and Agricultural Enforcement
U.S. Department of Labor – OSHA
200 Constitution Avenue, N.W., Room N-3119
Washington, DC 20210
202-693-1850

By and Under the Authority of

David Michaels, PhD, MPH
Assistant Secretary

https://www.osha.gov/OshDoc/Directive_pdf/CPL_02-00-160.pdf

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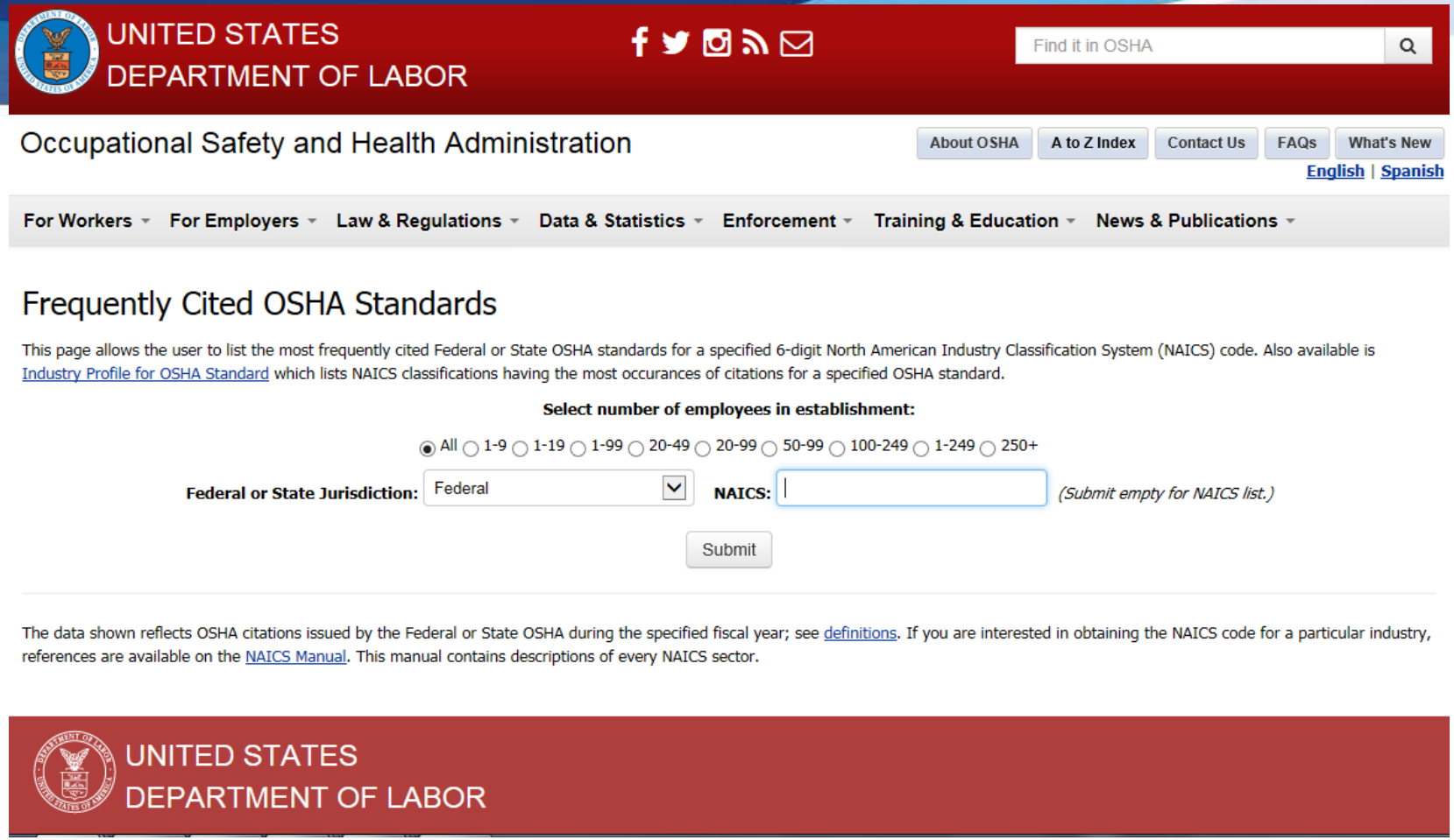
# Frequently Cited OSHA Standards




https://www.osha.gov/pls/imis/citedstandard.html

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# NAICS Code: 32 *Manufacturing (part 2 of 3)*

Listed below are the standards which were cited by **Federal OSHA** for the specified NAICS Code during the period October 2019 through Septemb
rather than initial amounts. For more information, see definitions.

| Standard | Citations | Inspections | Penalty | Description |
|---|---|---|---|---|
| Total | 3,184 | 882 | $11,958,497 | *All Standards cited for Manufacturing (part 2 of 3)* |
| 19100147 | 495 | 285 | $2,805,255 | The control of hazardous energy (lockout/tagout). |
| 19100134 | 276 | 121 | $333,259 | Respiratory Protection. |
| 19101200 | 276 | 164 | $379,031 | Hazard Communication. |
| 19100178 | 203 | 141 | $479,545 | Powered industrial trucks. |
| 19100212 | 200 | 189 | $1,745,022 | General requirements for all machines. |
| 19100305 | 109 | 77 | $149,933 | Wiring methods, components, and equipment for general use. |
| 19100095 | 105 | 53 | $203,090 | Occupational noise exposure. |
| 19100132 | 105 | 84 | $239,656 | General requirements. |
| 19100119 | 103 | 21 | $1,383,995 | Process safety management of highly hazardous chemicals. |
| 19101053 | 102 | 25 | $290,808 | --- *No Description Found* --- |

# NAICS Code: 325211 *Plastics Material and Resin Manufacturing*

Listed below are the standards which were cited by **Federal OSHA** for the specified NAICS Code during the period October 2018 through September 2019. rather than initial amounts. For more information, see definitions.

| Standard | Citations | Inspections | Penalty | Description |
|---|---|---|---|---|
| Total | 129 | 36 | $376,351 | *All Standards cited for Plastics Material and Resin Manufacturing* |
| 19100134 | 23 | 10 | $36,022 | Respiratory Protection. |
| 19101200 | 16 | 10 | $27,002 | Hazard Communication. |
| 19100119 | 13 | 4 | $60,540 | Process safety management of highly hazardous chemicals. |
| 19100147 | 10 | 6 | $16,271 | The control of hazardous energy (lockout/tagout). |
| 19100303 | 5 | 4 | $9,223 | General. |
| 19101053 | 5 | 1 | $9,130 | --- *No Description Found* --- |
| 19100212 | 4 | 4 | $14,738 | General requirements for all machines. |
| 19100219 | 4 | 1 | $8,752 | Mechanical power-transmission apparatus. |
| 19100022 | 3 | 3 | $15,355 | General requirements. |
| 19100106 | 3 | 2 | $18,564 | Flammable liquids. |
| 19100120 | 3 | 1 | $5,200 | Hazardous waste operations and emergency response. |
| 19100178 | 3 | 3 | $10,499 | Powered industrial trucks. |

# NAICS Code: 332992 *Small Arms Ammunition Manufacturing*

Listed below are the standards which were cited by **Federal OSHA** for the specified NAICS Code during the period October 2018 through September 2019. rather than initial amounts. For more information, see definitions.

| Standard | Citations | Inspections | Penalty | Description |
|---|---|---|---|---|
| Total | 44 | 5 | $212,225 | *All Standards cited for Small Arms Ammunition Manufacturing* |
| 19100119 | 10 | 2 | $22,116 | Process safety management of highly hazardous chemicals. |
| 19100109 | 4 | 1 | $26,520 | Explosives and blasting agents. |
| 19100134 | 4 | 1 | $6,630 | Respiratory Protection. |
| 19100212 | 3 | 2 | $17,251 | General requirements for all machines. |
| 19101025 | 3 | 2 | $17,124 | Lead. |
| 19101200 | 3 | 1 | $9,282 | Hazard Communication. |
| 19100132 | 2 | 1 | $7,374 | General requirements. |
| 19100133 | 2 | 1 | $0 | Eye and face protection. |
| 19100334 | 2 | 1 | $9,282 | Use of equipment. |
| 19040039 | 1 | 1 | $2,500 | --- *No Description Found* --- |
| 19100022 | 1 | 1 | $13,260 | General requirements. |
| 19100038 | 1 | 1 | $13,260 | Emergency action plans. |

# NAICS Code: 325998 *All Other Miscellaneous Chemical Product and Preparation Manufacturing*

Listed below are the standards which were cited by **Federal OSHA** for the specified NAICS Code during the period October 2019 through September 2020. Penalties
rather than initial amounts. For more information, see definitions.

| Standard | Citations | Inspections | Penalty | Description |
|---|---|---|---|---|
| Total | 88 | 19 | $246,773 | *All Standards cited for All Other Miscellaneous Chemical Product and Preparation Manufacturing* |
| 19100119 | 19 | 3 | $80,388 | Process safety management of highly hazardous chemicals. |
| 19100134 | 14 | 4 | $5,856 | Respiratory Protection. |
| 19101200 | 12 | 6 | $10,386 | Hazard Communication. |
| 19100147 | 8 | 6 | $31,017 | The control of hazardous energy (lockout/tagout). |
| 19100132 | 5 | 4 | $47,670 | General requirements. |
| 19100212 | 5 | 5 | $21,915 | General requirements for all machines. |
| 19100028 | 3 | 2 | $6,554 | Duty to have fall protection and falling object protection. |
| 19100095 | 3 | 1 | $3,500 | Occupational noise exposure. |
| 19100178 | 2 | 2 | $6,361 | Powered industrial trucks. |

# NAICS Code: 324110 *Petroleum Refineries*

Listed below are the standards which were cited by **Federal OSHA** for the specified NAICS Code during the period October 2019 through September 2020. rather than initial amounts. For more information, see definitions.

| Standard | Citations | Inspections | Penalty | Description |
|---|---|---|---|---|
| Total | 32 | 8 | $526,684 | *All Standards cited for Petroleum Refineries* |
| 19100119 | 23 | 7 | $451,116 | Process safety management of highly hazardous chemicals. |
| 19100120 | 3 | 1 | $13,494 | Hazardous waste operations and emergency response. |
| 19100147 | 3 | 3 | $40,482 | The control of hazardous energy (lockout/tagout). |
| 19100132 | 1 | 1 | $10,603 | General requirements. |
| 19100165 | 1 | 1 | $5,783 | Employee alarm systems. |
| 19101200 | 1 | 1 | $5,205 | Hazard Communication. |

# Compliance Assistance Resources

- OSHA Website (www.osha.gov)
  - A-Z index, regulations, publications, e-tools and advisors

- Compliance Assistance Specialists
- www.osha.gov/process-safety-management
- OSHA Consultation
- NIOSH (National Institute of Occupational Safety and Health)

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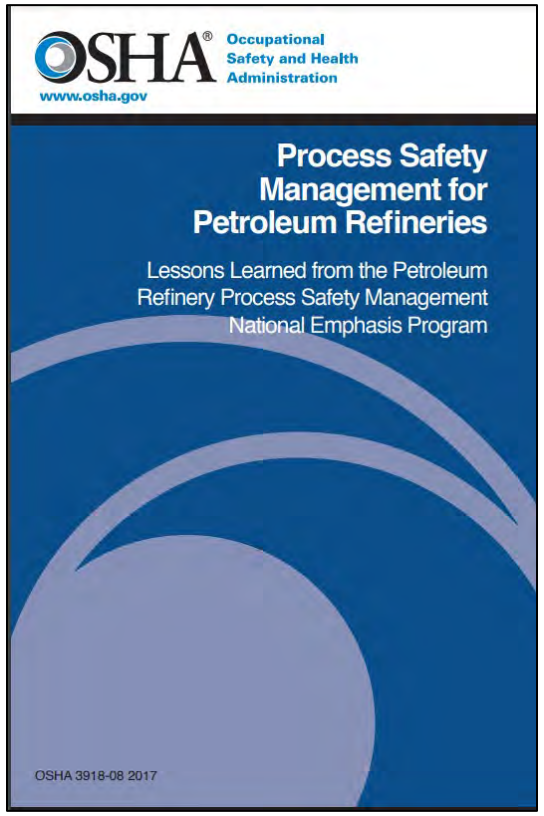
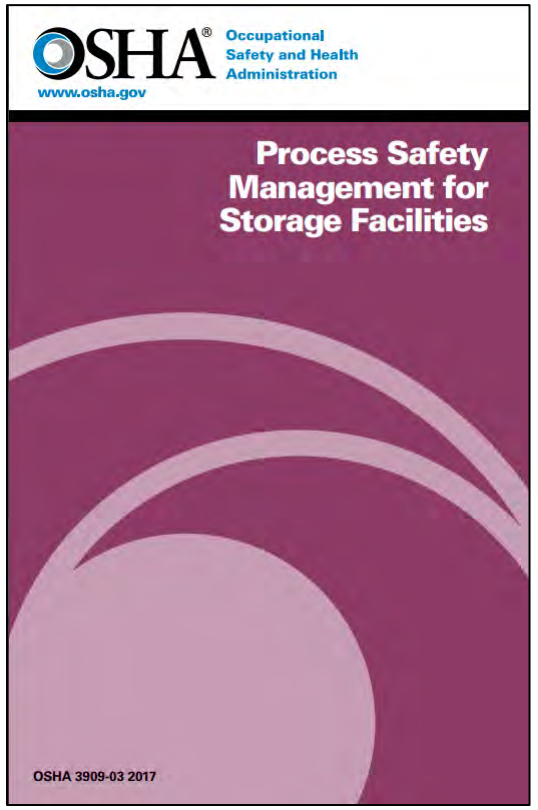
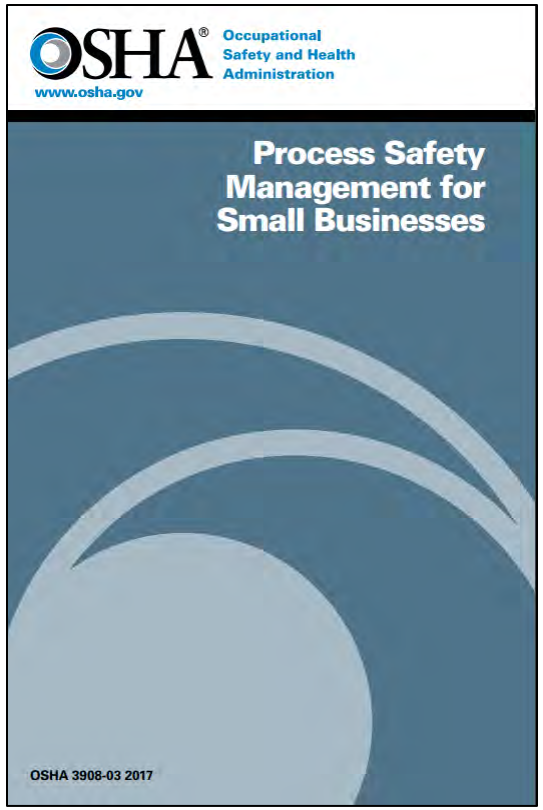
# Compliance Assistance Resources




- www.osha.gov/process-safety-management

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# Contact Your Local Compliance Assistance Specialist

**Compliance Assistance Specialists in Action**

OSHA's Compliance Assistance Specialists and other field staff conducted more than 5,000 outreach activities reaching more than 3 million people in fiscal year 2020.

- COVID-19
- Fall Prevention
- Health Care
- Hispanic/Latino Workers and Employers
- Severe Weather
- Roadway Safety
- Suicide Prevention
- Temporary Workers
- Young Workers

| Office | Compliance Assistance Specialist | Phone Number |
|---|---|---|
| Birmingham Area Office | Francisco Garcia | (205) 731-1534 |
| Mobile Area Office | Francisco Garcia | (251) 441-6131 |
| Little Rock Area Office | John Wolfe | (501) 224-1841 |
| Denver Regional Office | John Olaechea | (720) 264-6586 |
| Denver Area Office | *Contact Area Office* | (303) 844-5285 |
| Englewood Area Office | *Contact Area Office* | (303) 843-4500 |
| Bridgeport Area Office | Marianne Bonito | (203) 579-5581 |
| Hartford Area Office | Paul Mangiafico | (860) 240-3152 |

Available to answer questions, give presentations, and appear at events

Find your local CAS at:
https://www.osha.gov/complianceassistance/cas

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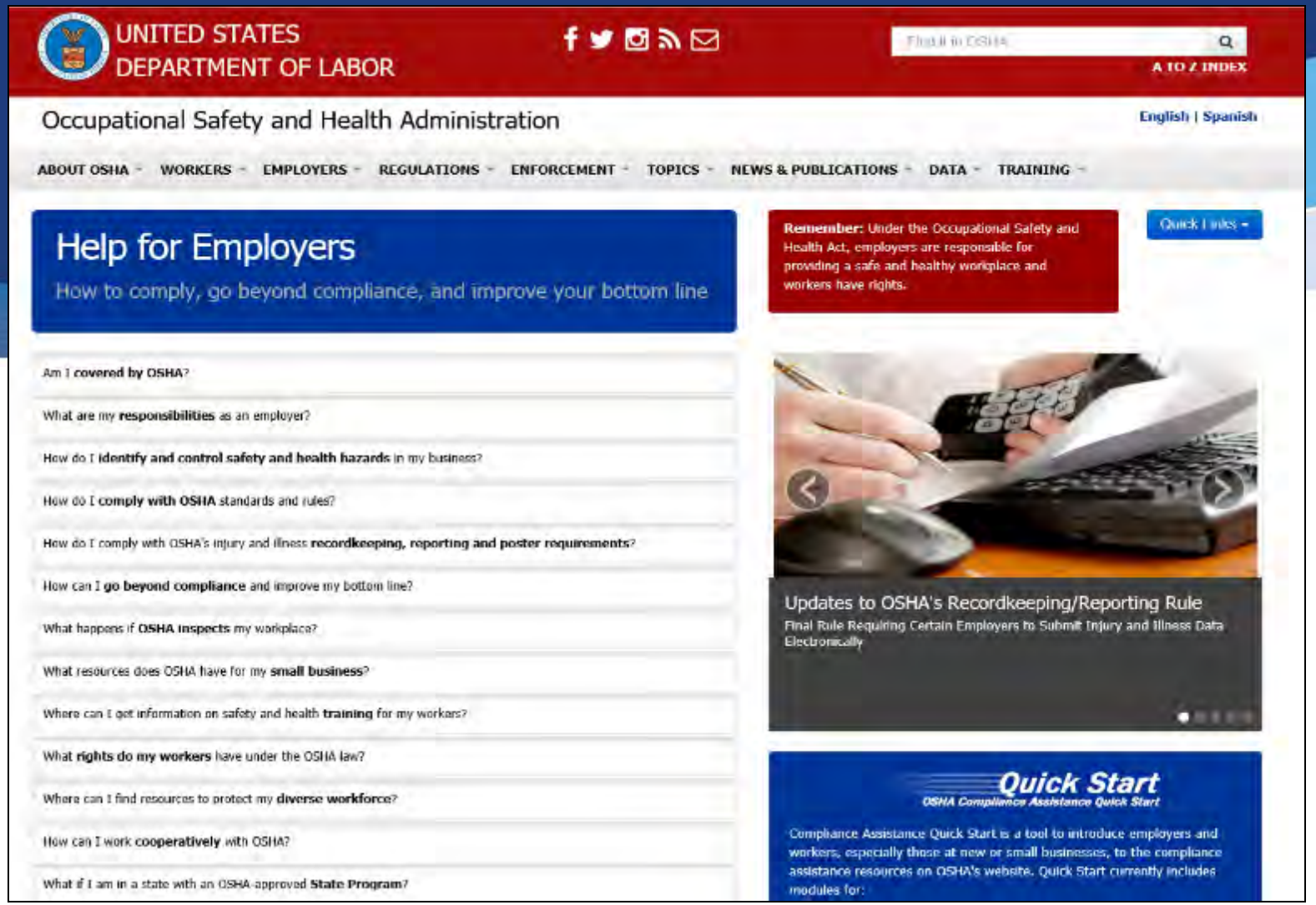


https://www.osha.gov/employers/index.html

# OSHA Consultation

In FY 2017, responding to requests from small employers looking to create or improve their workplace safety and health programs, OSHA's On-Site Consultation Program conducted approximately 26,000 visits to small business worksites covering over 1.1 million workers across the nation.

**OSHA's Consultation Directory**
Find the Local Office in Your State

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# OSHA Consultation

- Free
- Non-enforcement
- Confidential
- On-site audits
- Training
- Sampling/Monitoring
- Program Review


http://csu-cvmbs.colostate.edu/academics/erhs/osha/Pages/default.aspx

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# OSHA Compliance Assistance

- Regional Compliance Assistance Newsletter
- Send request to olaechea.john@dol.gov to subscribe

OSHA Region VIII Compliance Assistance Newsletter

Fall 2020

50 OSHA

Protecting the American Workforce

COVID-19 Data

A summary of OSHA COVID-19 response data is now available. Review statistics on outreach and enforcement including complaint investigations and inspections.

NATIONAL PREPAREDNESS MONTH

September is National Preparedness Month (Learn More)

Disasters Don't Wait. Make Your Plan Today.

Free NIOSH Training

Marijuana and Driving

How to Keep Your Fleet Safe

September 16, 1-2:30 p.m. (EDT): Marijuana and Driving, How to Keep Your Fleet Safe: The NIOSH Center for Motor Vehicle Safety invites health and safety professionals to learn more about this topic. Speakers John Howard, MD, NIOSH Director, and Natalie Hartenbaum, MD, President and Chief Medical Officer of OccuMedix, Inc. Register for free.

FREE TRAINING RESOURCES AND EVENTS

Volume 7, Issue 2

State of Montana's SafetyFest To Offer Many Free Virtual Courses in November

10TH ANNIVERSARY Celebrating 10 Years!

SafetyFestMT is a collaborative effort between the Montana Department of Labor & Industry and businesses/entities across the state who donate their time to present various topics. This collaboration allows SafetyFestMT to provide FREE quality training to employers and their workers throughout Montana. Just as the needs of each community in Montana are diverse and unique, so is each SafetyFest. Each event provides classes that focus on the specific needs of the region along with a core curriculum of classes such as OSHA 10 and 30 Hour, First Aid/CPR, and Hazwoper. You do not have to work in Montana to register for these free classes. The Bozeman Safety Fest will be virtual and is scheduled for November 16-20. On-location SafetyFests will resume in 2021. For future dates or more information on the program, please visit: http://safetyfestmt.dli.mt.gov/

Free Trench Training from the Rocky Mountain Education Center

Digging Deeper into Construction Trenching and Excavation Hazards (Virtual Course)

This course is instructor led with 7.5 hours of teaching content via the Susan Harwood Grant program. Participants with responsibilities for the safe work of others around trenches and excavations who are employed by construction companies with less then 250 employees may be eligible to become trainers and receive all curricula content with a commitment of training at least 10 workers using the materials before the grant end date. All participants receive the Red Rocks Community College's *Digging Deeper* student manual; a 95-page document that has been approved for use in this program by US DOL OSHA. The manual illustrates safe industry practices aligned to the US DOL OSHA standards for working in and around trenches and excavations. Two dates are scheduled for September. Register here.

Respiratory Protection: OSHA Region VI Training Institute Education Centers are offering a free video on respiratory protection. The video provides guidance on the proper implementation of a respiratory protection program and its relationship to the current COVID-19 pandemic. For more information and to register to receive the video link, please click here.

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# Process Safety Management Overview

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# Process Safety Management Elements

(a) Application

(b) Definitions

(c) Employee Participation

(d) Process Safety Information

(e) Process Hazard Analysis

(f) Operating Procedures

(g) Training

(h) Contractors

(i) Pre-Startup Safety Review

(j) Mechanical Integrity

(k) Hot Work Permits

(l) Management of Change

(m) Incident Investigation

(n) Emergency Planning and Response

(o) Compliance Audits

(p) Trade Secrets

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# Process Safety Information (PSI)

- Employers must compile written process safety information (PSI)
  - Hazards of the HHCs used/produced
  - Technology of the process
  - Equipment in the process

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# PSI

- Process Hazards
  - Permissible exposure limits (PEL)
  - Physical data
  - Reactivity data
  - Corrosivity data
  - Thermal/chemical stability
  - Effects of mixing
    - » SDS may be source

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# PSI

- Process Technology
  - Block flow diagram/process flow diagram
  - Process chemistry
  - Maximum intended inventory
  - Safe upper/lower limits
    - temperatures, pressures, flows, compositions, pH
  - Evaluation of consequences of deviation

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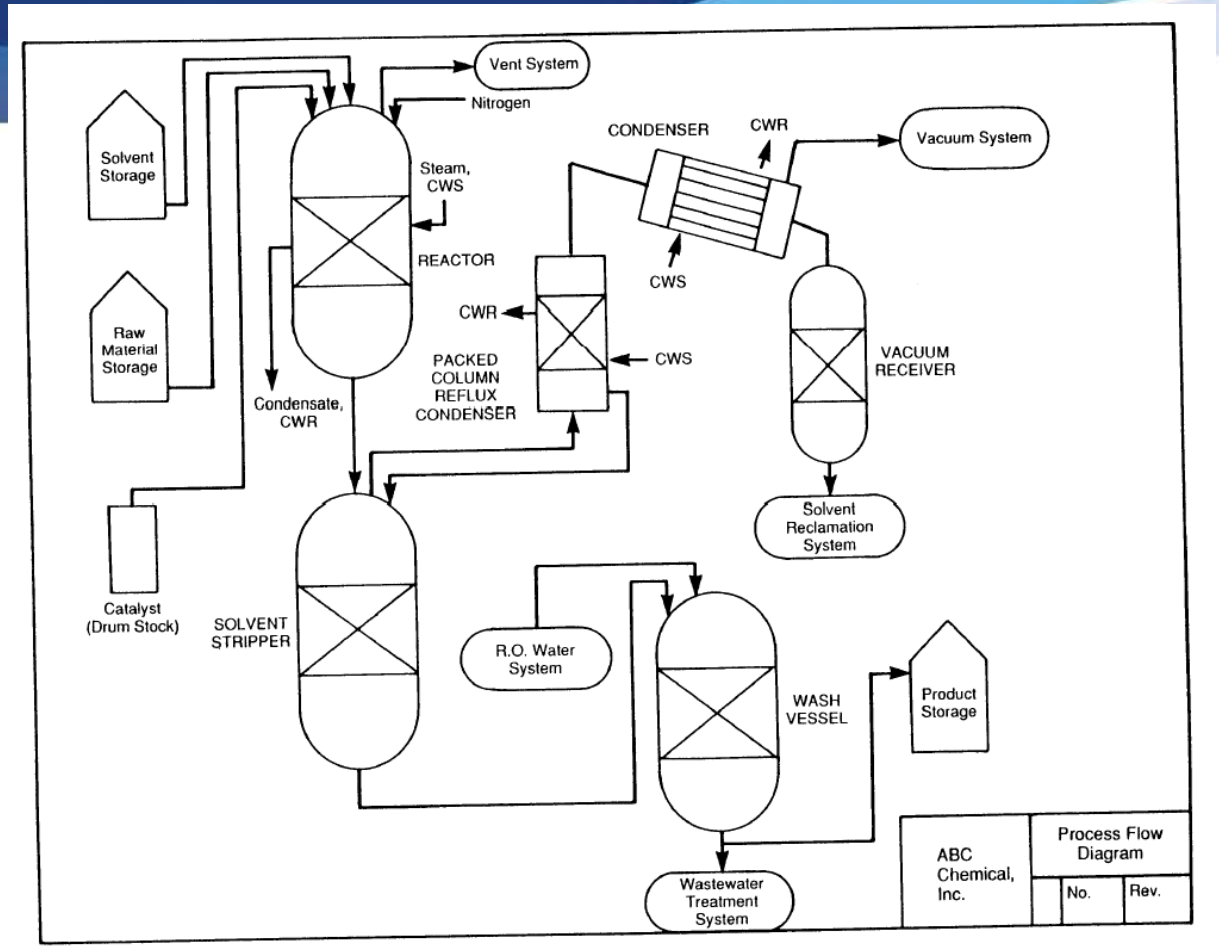
# Process Flow Diagram

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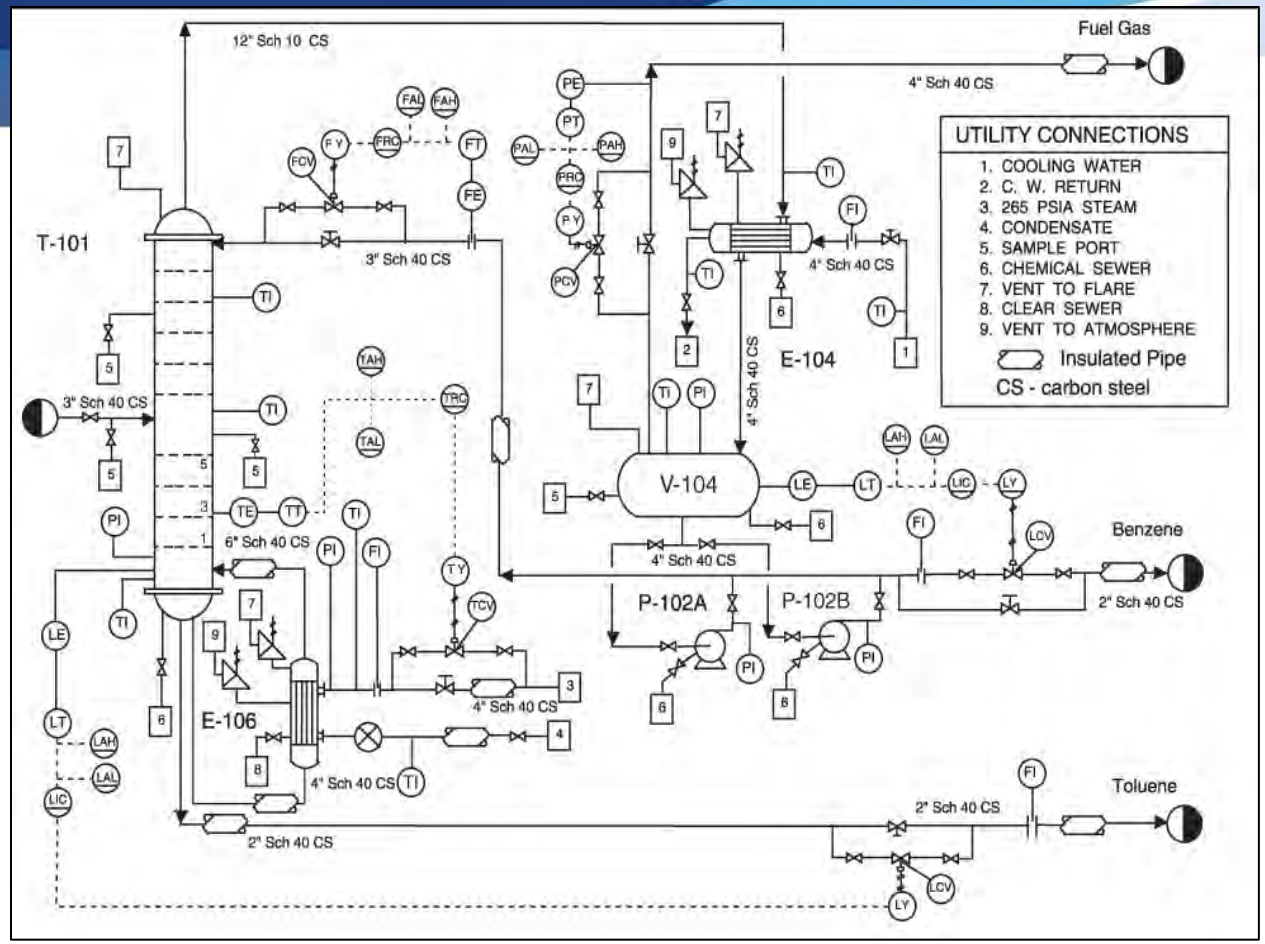
# PSI

- Process Equipment
  - Materials of construction
  - Piping and Instrumentation diagrams (P&IDs)
  - Electrical classification
  - Relief system design and design basis
  - Ventilation system design
  - Design codes and standards (ASME, API, ANSI, CGA, IIAR, etc)
  - Material and energy balances (built after 1992)
  - Safety systems (interlocks, detection, suppression)

# Piping and Instrumentation Diagram (P&ID)

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# PSI

- The employer shall document that the equipment complies with Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)
  - ASME, CGA, API, ANSI, IIAR, etc
  - RAGAGEP also applies to Mechanical Integrity
  - RAGAGEP is for equipment design, inspection and testing, and frequency of inspection and testing

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# PSI

- Examples of RAGAGEP
  - ASME (American Society of Mechanical Engineers)
  - ANSI (American National Standards Institute)
  - CGA (Compressed Gas Association)
  - API (American Petroleum Institute)
  - ASTM (American Society for Testing and Materials)
  - IIAR (International Institute of Ammonia Refrigeration)
  - Manufacturer (Operations/Maintenance manuals)
  - Internal RAGAGEP

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# Process Hazard Analysis (PHA)

- PHA is a thorough, systematic approach for identifying, evaluating and controlling the hazards of processes involving HHCs
  - The employer must perform a PHA on all covered processes
  - The PHA format must meet the complexity of the process
  - The PHA must identify, evaluate, and control the hazards involved in the process

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# PHA

- PHA Methods
  - What-if
  - Checklist
  - What-if/checklist
  - Hazard and operability study (HAZOP)
  - Failure mode and effects analysis (FMEA)
  - Fault tree analysis, or
  - An appropriate equivalent methodology

» See OSHA publication 3133 for more information

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# PHA

- PHA shall address:
  - Hazards of the process
  - Prior incidents
  - Engineering and administrative controls
  - Consequences of failure of those controls
  - Facility siting
  - Human factors
- Shall be performed by a team
- Shall establish a system to address findings
- Revalidation every 5 years

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# Operating Procedures

- Written operating procedures for safely conducting activities in each covered process
- Covering:
  - Initial startup, normal/temporary/emergency operations, shutdowns
  - Operating limits, consequences of deviation, and steps required to correct
  - Safety/Health considerations
    - Hazards of chemicals, unique hazards, material control
    - Engineering controls, administrative controls, PPE
    - Safety systems and their functions

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# Operating Procedures

- Must be readily available to employees
- Reviewed as necessary to reflect current practices
- Annual certification of review

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# Employee Participation

- Employers must consult with employees and their reps on the development of the elements of process safety management
- Employers shall provide employee access to all information required by the PSM standard
- Employer shall develop a written plan regarding the implementation of employee participation

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# Training

- Initial training in the process
  - Overview of process and ops procedures
  - Safety and health hazards
  - Emergency operations/shutdown
  - Safe work practices applicable to employee's tasks
- Refresher training at least every 3 years
- Documentation of training (must state the means by which the training was shown to be effective)

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# Mechanical Integrity

- Written procedures for maintaining the on-going integrity of:
  - Pressure vessels
  - Piping systems
  - Relief and vent systems and devices
  - Emergency shutdown systems
  - Controls (monitoring devices, sensors, alarms, interlocks)
  - Pumps

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# Mechanical Integrity

- Inspection and testing of equipment shall follow RAGAGEP
- Maintenance employees shall be trained
- Inspections shall be documented
- Equipment deficiencies shall be corrected in a safe and timely manner (ensure safe operation)

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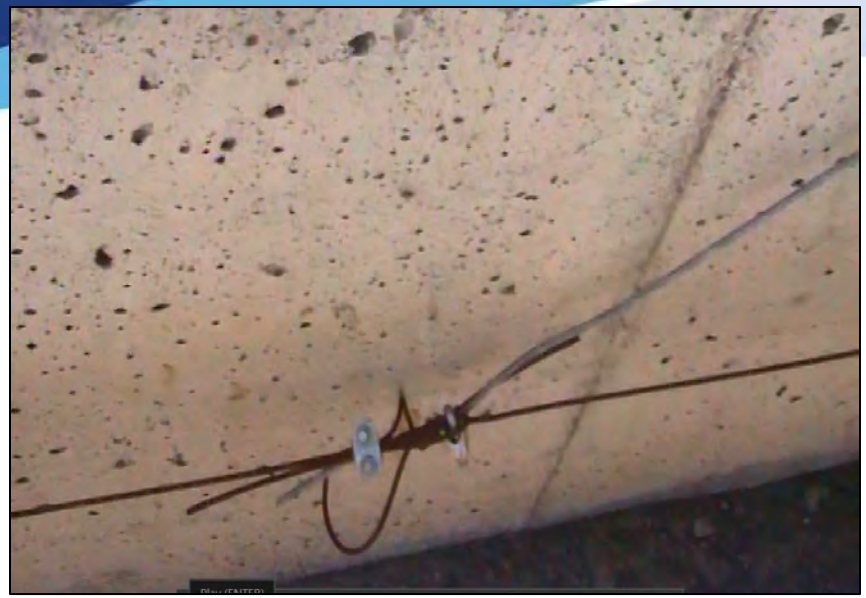
# MI

Rusted and broken cable to the “snappy joe” shut off valve



Rusted cable repaired by attaching new cable to old rusted piece

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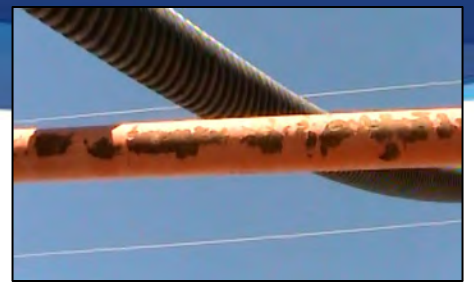
# MI



Missing paint and rust on ammonia piping.  No flow direction or phase markings.  Color?

Broken pressure gauges

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# Management of Change (MOC)

- Written procedures to manage changes to process chemicals, technology, equipment, and procedures that affect a covered process
  - technical basis for proposed change
  - impact of change on safety and health
  - modifications to operating procedures
  - time period for the change
  - authorization requirements for the change
- Does not include “replacements in kind”
- Requires updated PSI, op procedures, training

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# The other elements…

(a) Application

(b) Definitions

(c)Contractors

(i) Pre-Startup Safety Review

(k) Hot Work Permits

(m) Incident Investigation

(n) Emergency Planning and Response

(o) Compliance Audits

(p) Trade Secrets

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# ChemNEP Citations by PSM Element

| Element | Description | % of PSM Citations | Cum % |
|---|---|---|---|
| j | Mechanical Integrity | 26.9 | 26.9 |
| d | Process Safety Information | 19.6 | 49.2 |
| e | Process Hazard Analysis | 15.3 | 64.5 |
| f | Operating Procedures | 10.5 | 74.9 |
| l | Management of Change | 5.2 | 80.1 |
| h | Contractors | 4.7 | 84.9 |
| o | Compliance Audits | 3.6 | 88.5 |
| n | Emergency Response and Planning | 3.4 | 91.9 |
| g | Training | 3.2 | 95.1 |
| c | Employee Participation | 2.1 | 97.2 |
| m | Incident Investigation | 1.3 | 98.5 |
| i | Pre-startup Review | 1.1 | 99.6 |
| k | Hot Work | 0.4 | 100 |



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# Appendix C (1910.119)

- Non-mandatory Compliance Guidelines
  - Detailed description of each element of the standard
  - Plain language summary and recommendations
  - Good introduction to the standard

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# Questions?

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# Disclaimer

- This information has been developed by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics, it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA's website at www.osha.gov.

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