WELCOME
2016 25th Environmental Federation of Oklahoma (EFO) Meeting

“25 Years of Environmental Law, Policy and Politics – Where Do We Go From Here?”

Update – Process Safety Management (PSM) - (25 min)

Brett A. Wheelock
Topics

• Brief Specific Industry Background
• Agency Regulations
• Regulations Environment – Presidential Executive Order #13650
• PSM Facility Ownership
• RAGAGEPs
• EPA Risk Management Program (RMP) vs. OSHA Process Safety Management
• OSHA’s 1% Highly Hazardous Chemicals (HHC) concentration rule
• DHS Security – Topscreen 2.0 Resubmissions CSAT, SVA, SSP (New)
• DOT 49 CFR Product Odorization
Brief Industry Background
Chemical Facility Ownership

Agency Regulations
What Does Security Mean Today?

TSA Freight Rail Security Regulations for Toxic Inhalation Hazard Materials (49 CFR Part 1580)

NERC CIP Reliability Standards

Power Lines

Chemical Facility

TANKER TRUCKS


If subject to MTSA, then TWIC applies. (49 CFR Part 1572)

Inherently Safer Technology

Pipelines

NOTES & LEGEND

1. K Rated Gate
2. Gatehouse with Uniformed Guards
3. Tanker Truck Gate
4. Rail Gate

Fence

IDS

Cameras to cover IDS zones

Fixed cameras at all gates

Security integration vendor has SAFETY ACT PROTECTION (6 CFR Part 25)

Pursuant to Section 1557 of the Implementing Recommendations of the 9/11 Commission Act of 2007, TSA has the authority to regulate pipeline security. Federal interest in and activities around pipeline security have increased.
What Does Security Mean Today?

Facility: EPA 40 CFR Part 68 RMP
- Worst Case Explosion (WCE) and Alternative Release Scenario (ARS) for single largest vessel/event.

DHS 6 CFR 27 Chemical Facility Anti-Terrorism Survey (CFATS)

Transportation Security Administration (TSA)
- Criticality Assessments & Security Vulnerability Analysis (SVA)

HAZMAT: DOT 49 CFR 100-185

Facility: OSHA 29 CFR 1910

Oil/Condensate Tanks: EPA 40 CFR 112 SPCC

Emissions EPA 40 CFR 60 NSPS 0000, etc.

Rail: DOT FRA 49 CFR 200-299

Facility: EPA 40 CFR Part 68 RMP
- Worst Case Explosion (WCE) and Alternative Release Scenario (ARS) for single largest vessel/event.

Liquids PL: DOT 49 CFR 195, etc.

Transmission Gas PL: DOT 49 CFR 192, etc.

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NERC CIP Reliability Standards

Power Lines

TANKER TRUCKS

Fluids PL: DOT 49 CFR 195, etc.

Transportation Security Administration (TSA)
- Criticality Assessments & Security Vulnerability Analysis (SVA)

Regulations, Standards and Recommended Practices

Regulation
• OSHA 29 CFR 1910.119 – Process Safety Management (PSM)
• EPA 40 CFR 112 – Spill Prevention Control and Countermeasure Plan (SPCC)
• EPA 40 CFR Part 68 – Risk Management Program (RMP)
• DHS (Domestic Security) 6 CFR 27 – Chemical Facility Anti-Terrorism Standards (CFATS)
• DOT 49 CFR 192/195 – Pipeline and Hazardous Materials Safety Administration (PHMSA); State-level Oklahoma Corporation Commission (OCC)

RAGAGEP/ Recommended Practices/ Standards
• National Fire Protection Association (NFPA) Standards – Including National Electric Code (NEC)
• American Petroleum Institute (API) Standards
• American National Standards Institute (ANSI) Standards
• American Society for Testing and Materials (ASTM) Standards
• American Society of Mechanical Engineers (ASME) Standards
• Institute of Electrical and Electronics Engineers (IEEE) Standards
• Tubular Exchanger Manufacturers Association (TEMA) Standards
• Various others…………
Regulations Environment
The focus of the EO is to reduce risks associated with hazardous chemical incidents to owners and operators, workers, and communities by enhancing the safety and security of chemical facilities. A Federal Interagency Working Group led by the Assistant Secretary of Homeland Security for the Office of Infrastructure Protection (DHS); Assistant Secretary of Labor for the Occupational Safety and Health Administration (OSHA); and the Assistant Administrator of the Environmental Protection Agency’s (EPA) Office of Solid Waste and Emergency Response, in coordination with the Department of Justice (DOJ), Bureau of Alcohol, Tobacco, and Firearms (ATF), Department of Transportation (DOT), and the Department of Agriculture (USDA) oversees chemical facility safety and security.

Note: Refer to West Fertilizer Explosion Incident, See CSB Presentation here: http://www.csb.gov/videos/dangerously-close-explosion-in-west-texas/
Through the analysis of the current operating environment, existing regulatory programs and stakeholder feedback, a consolidated Federal Action Plan was created to address five elements:

- Strengthening community planning and preparedness
- Enhancing Federal operational coordination
- Improving data management
- Modernizing policies and regulations
- Incorporating stakeholder feedback and developing best practices
PSM Facility Ownership

People & Property
Regulation
Across the Various Layers of Protection
EPA Risk Management Program (RMP)

Agency Objectives – 40 CFR Part 68

- EPA’s Risk Management Program is about reducing chemical/fire/explosion risk at the local level
- This information helps local fire, police, and emergency response personnel—who must prepare for and respond to accidents
- Useful to citizens in understanding the hazards in their communities
- EPA anticipates that making the RMPs available to the public stimulates communication between industry and the public to improve accident prevention and emergency response practices at the local level.
EPA Risk Management Program (RMP)

Plan – 40 CFR Part 68

• HAZARD ASSESSMENT that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases

• PREVENTION PROGRAM that includes safety precautions and maintenance, monitoring, and employee training measures

• An EMERGENCY RESPONSE PROGRAM that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g. the Fire Department, Police, Sheriff, Ambulance, HazMat Responders, Bomb Squad, and others) should an accident occur.
# EPA 40 CFR vs. OSHA 29 CFR

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Process Safety Information (PSI)</td>
<td>§ 68.65</td>
<td>§ 1910.119(d)</td>
</tr>
<tr>
<td>Process Hazard Analysis (PHA)</td>
<td>§ 68.67</td>
<td>§ 1910.119(e)</td>
</tr>
<tr>
<td>Operating Procedures</td>
<td>§ 68.69</td>
<td>§ 1910.119(f)</td>
</tr>
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<td>Training</td>
<td>§ 68.71</td>
<td>§ 1910.119(g)</td>
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<td>Mechanical Integrity</td>
<td>§ 68.73</td>
<td>§ 1910.119(j)</td>
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<td>Management of Change (MOC)</td>
<td>§ 68.75</td>
<td>§ 1910.119(l)</td>
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<tr>
<td>Pre-Startup Review</td>
<td>§ 68.77</td>
<td>§ 1910.119(i)</td>
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<tr>
<td>Compliance Audits</td>
<td>§ 68.79</td>
<td>§ 1910.119(o)</td>
</tr>
<tr>
<td>Incident Investigation</td>
<td>§ 68.81</td>
<td>§ 1910.119(m)</td>
</tr>
<tr>
<td>Employee Participation</td>
<td>§ 68.83</td>
<td>§ 1910.119(c)</td>
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<tr>
<td>Hot Work Permit</td>
<td>§ 68.85</td>
<td>§ 1910.119(k)</td>
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<tr>
<td>Contractors</td>
<td>§ 68.87</td>
<td>§ 1910.119(h)</td>
</tr>
<tr>
<td>Trade Secrets</td>
<td>Not Required</td>
<td>§ 1910.119(p)</td>
</tr>
</tbody>
</table>

* EPA RMP, Part 68 Program 3 audits will mostly mirror an OSHA 119 audit.
Process Safety Management (PSM) 14 Elements

1. Process Safety Information
2. Process Hazard Analysis
3. Operating Procedures
4. Employee Participation
5. Training (Initial & Refresher)
6. Compliance Audits
7. Trade Secrets
8. Emergency Planning & Response
9. Incident/Accident Investigation
10. Management of Change
11. Hot Work Permit
12. Mechanical Integrity
13. Pre-Startup Safety Review
14. Contractors

Occupational Safety & Health Administration 29CFR 1910.119
20 CCPS Management System Elements

Center for Chemical Process Safety (CCPS)

- Process Safety Culture
- **Compliance with Standards**
- Process Safety Competency
- Workforce Involvement
- Stakeholder Outreach
- Process Knowledge Management
- Hazard Identification & Risk Analysis
- Operating Procedures
- Safe Work Practices
- Asset Integrity and Reliability
- Contractor Management
- Training and Performance Assurance
- Management of Change
- Operational Readiness
- Conduct of Operations
- Emergency Management
- Incident Investigation
- Measurement and Metrics
- Auditing
- Management Review and Continuous Improvement
- Implementation and the Future
Recognized and Generally-Accepted Good Engineering Practice (RAGAGEP)
Defining RAGAGEP for Employers

**HOT Topic**

The Center for Chemical Process Safety’s (CCPS) definition of RAGAGEPs is as follows:

“The basis for engineering, operation, or maintenance activities and are themselves based on established codes, standards, published technical reports or recommended practices or similar documents. RAGAGEPs detail generally approved ways to perform specific engineering, inspection or mechanical integrity activities, such as fabricating a vessel, inspecting a storage tank, or servicing a relief valve.”

Employers are currently required by the OSHA standard to meet Recognized and Generally Accepted Good Engineering Practices (RAGAGEP).
Early Recognition of RAGAGEP

On March 23, 2000 OSHA sent a letter to ISA endorsing IEC 61511 / ISA 84 as a “National Consensus Standard” for SIS and states:

1) The standard is a “Recognized and Generally Accepted Good Engineering Practice” per 29 CFR 1910.119 (d)(3)(ii) PSM Standard

2) Evaluating whether an employer’s engineering practices, with respect to SISs comply with PSM and meets the requirements of IEC 61511 / ISA 84

3) A large % of processes are NOT covered by PSM but may require SIS, due to potential hazards to personnel

The Specification, Design and Verification Process
The performance-based approach to PSM requires employers to “Say what you’ll do, and do what you say!”

- Jim Lay, “OSHA PSM RAGAGEP Enforcement” June 8, 2015
Primary Sources of RAGAGEP

**Appropriate Internal Standards**

Internally developed standards must still represent RAGAGEPs. Must be consistent with OSHA’s intent. Legitimate purposes include:

- **Translating published requirements** into detailed programs and/or procedures
- **Setting requirements** for unique processes, equipment, and hazards for which **no published RAGAGEP exists**
- **Supplementing the published RAGAGEP** with their own applicable practices, protocols, and procedures to control hazards
- **Controlling hazards more efficiently** than the available codes, standards, or practices
- **Addressing hazards** when the **codes and standards are outdated**

Employers’ internal standards must either meet or exceed the protective requirements of published RAGAGEP
Appropriate Internal Standards

PSM interpretation does not imply that employers may disregard applicable published RAGAGEP. However, in the absence of an appropriate standard, the employer must document:

1. **Evidence** that no existing standard is applicable
2. Prove through **relevant process hazard analyses (PHAs)** and supporting **documents** that additional means of protection is/ is not required
3. Establish that the **internal approach is as protective** as the published RAGAGEP
4. It **represents “good engineering practice”**
5. The PSM standard makes no reference to a ‘**take-it OR leave-it**’ approach to RAGAGEP selection (OSHA-added emphasis)

Employers that meet published RAGAGEP, but don’t comply with their own more stringent internal requirements, may be cited under 1910.119(j)
## Common RAGAGEPs

### Hot Topic Example

1. **ITEMS:**
   - Boilers
   - Pressure Vessels
   - Piping
   - Valves
   - Aboveground Storage Tanks
   - Safety/Safety Relief Valves
   - Pumps
   - Instrumentation and Controls
   - Pipelines (49 CFR-186-199)

2. **DESIGN OR CONSTRUCTION CODES:**
   - ASME I
   - ASME IV (DIV. 1 & 2)
   - ASME VIII
   - ASME B31.1
   - ASME B31.3
   - ASME B16.34
   - API 600
   - API 609
   - API 12B
   - API 650
   - API 620
   - ASME I
   - ASME IV
   - ASME VIII
   - API 2000
   - API 610
   - API 574-676
   - VARIOUS ISA STANDARDS AND RP 551
   - B31.4
   - B31.8
   - API 1104

3. **INSPECTION, REPAIR, ALTERATION, RERATING, OR FITNESS FOR SERVICE CODES:**
   - NBIC
   - API 510
   - API 570
   - API 579
   - API 598
   - API RP591
   - API 653
   - API 579
   - NBIC
   - API RP 576
   - API RP683
   - MFG STDS
   - ISA/MFG STANDARDS
   - ASME B31G

4. **“SUPPORT” OR “REFERENCED” CODES OR PUBLICATIONS:**
   - ASME II, ABCD
   - ASME V
   - ASME VI & VI
   - ASME IX
   - API RP 573
   - 5NT-TC-1A
   - ASME II, ABCD
   - ASME V
   - ASME IX
   - API RP 572
   - API IRE II
   - 5NT-TC-1A
   - ASME II, ABCD
   - ASME V
   - ASME IX
   - API RP 574
   - ASME B16.5
   - 5NT-TC-1A
   - API RP 574
   - ASME V
   - ASME IX
   - AWS D14.5
   - ASME PTC-25
   - ASME V
   - ASME IX
   - MFG. STANDARDS
   - INSTRUMENT ENGINEER’S HANDBOOK
   - MFG. STANDARDS
   - ASME V
   - ASME IX

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**Note:** The diagram contains additional codes and standards that are not listed here for the sake of brevity. The diagram provides a visual representation of the hierarchy and interrelations of these codes.
PSM Documentation Now Required

Employers are required to establish and document:

- Not only PSM-covered process equipment but also equipment whose operation could affect the covered process equipment
- Track the **age and installation date** of the process and equipment
- **Process and equipment modifications**, including the date and extent of process changes
- The **edition and publication date** of selected RAGAGEP
- How the employer’s **internal requirements** are more stringent
- **Written procedures for inspection and testing** of equipment
- **Compliance to changes** in selected RAGAGEP through PHA Revalidation and Management of Change (MOC) processes, OR via corporate monitoring and review of published standards

OSHA now expects Employers to apply RAGAGEP and the enhanced documentation requirements to a **wider range of equipment**
Potential Inspection Targets

– Selectively **mixing-and-matching provisions/sections** from multiple RAGAGEP addressing similar hazards **may be inappropriate** and could result in inadequately controlled hazards

– The PSM standard requires employers to have **written procedures for inspection and testing of equipment** and is in accordance with their selected RAGAGEP

– Employers must document that their **PSM-covered process equipment and equipment whose operation could affect** that process **comply** with RAGAGEP

– When an Employer is operating deficient equipment based on the use of **interim safeguards**, the Employer must develop and implement an **MOC procedure** for the **continued safe operation** of the equipment

– **Older equipment not covered** or operating under **obsolete RAGAGEP** now requires **documented evidence** that the equipment is **designed, maintained, inspected, tested, and operating** in a safe manner
Definition – ‘Should/Shall’ Language in Documents

• “Shall” and “Must”
  – “Shall,” “Must,” or similar language used in published RAGAGEP reflects the (Standard) view that the practice is a mandatory minimum requirement

• “Should”
  – Use of the term “Should” or similar language in the RAGAGEP reflects an acceptable and preferred approach
  – OSHA presumes that employer compliance with the recommended approach is acceptable

• “Should Not”
  – “Should Not” or similar language describes disfavored or less than fully protective practices
  – Following such disfavored practices is presumed to be a violation

If an employer deviates from “Shall” or “Should Not” requirements in the Employer’s adopted RAGAGEP, OSHA will presume a violation
RAGAGEP Example


**RAGAGEP Example 1 – Fired Heater / BMS Permissive**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>NFPA 85</th>
<th>NFPA 86</th>
<th>S84-TR5</th>
<th>API 556</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Fuel block valves proved closed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.2 Absence of flame proved</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.3.1 Pre-purge flow proved</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.3.2 Pre-purge timer complete</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.4 Air proved at low fire rate</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.5 Fuel pressure in correct range</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.6 Pilot flame detected within time</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.7 Main fuel set at low fire position</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.8 Main flame detected within time</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1.9.1 Post purge flow proved</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.2 Post purge timer complete</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10.1 Adequate process level</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>1.10.2 Adequate process flow</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Chart courtesy of Emerson Process Controls
# RAGAGEP Example 2 – Interlocks: Ignition, Air & Fuel

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Condition</th>
<th>NFPA 85</th>
<th>NFPA 86</th>
<th>S84-TR5</th>
<th>API 556</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Loss of flame</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.2</td>
<td>Loss of combustion air</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.3</td>
<td>Low furnace pressure</td>
<td>✓</td>
<td>✓</td>
<td>🟢</td>
<td>✓</td>
</tr>
<tr>
<td>2.4</td>
<td>High furnace pressure</td>
<td>✓</td>
<td>✓</td>
<td>🟢</td>
<td>✓</td>
</tr>
<tr>
<td>2.5</td>
<td>Low fuel pressure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.5.1</td>
<td>Low fuel pressure – at pilot</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.5.2</td>
<td>Low fuel pressure – at main burner</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.6</td>
<td>High fuel pressure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.6.1</td>
<td>High fuel pressure – at pilot</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>2.6.2</td>
<td>High fuel pressure – at main burner</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.7.1</td>
<td>Loss of atomizing medium</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>2.7.2</td>
<td>Heated oil – Low temp/High visc</td>
<td>✓</td>
<td>✓</td>
<td>N/A</td>
<td>✓</td>
</tr>
<tr>
<td>2.7.3</td>
<td>High heated oil temperature</td>
<td>✓</td>
<td>✓</td>
<td>N/A</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Chart courtesy of Emerson Process Controls*
## RAGAGEP Example 3 – Interlocks: Systems and Processes

<table>
<thead>
<tr>
<th>Section</th>
<th>Condition</th>
<th>NFPA 85</th>
<th>NFPA 86</th>
<th>S84-TR5</th>
<th>API 556</th>
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<tbody>
<tr>
<td>3.1</td>
<td>Loss of actuating energy</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>3.2</td>
<td>Power failure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3.3</td>
<td>Emergency Shutdown</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4.1</td>
<td>Low (water) level</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>4.2.1</td>
<td>Excess (steam) pressure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Excess (water) temperature</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4.3</td>
<td>Low process flow</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4.4</td>
<td>High furnace discharge temp</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>High skin temperature</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Chart courtesy of Emerson Process Controls
Documentation Requirements & Regulatory Compliance

- Safety Instrumented Function list (SIF)
- Safety Requirement Specification (SRS)
- SIL Verification Calculations
- Cause and Effect Table (C&E)
- P&IDs
- SIS Logic
- Loop Diagrams
- Logic Solver Panel Design
- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Verification / Validation Checklist
- Functional Safety Assessment
- Installation and Commissioning QA/QC records
- Operating and Maintenance Procedures
- Executed Proof Test Procedures
- SIS Demand and Failure Tracking Log
- SIS Practice and Recording
- Audit Records
- MOC Records
- Training Records

Important! Know what documentation is required and to consider the means of generation, archiving & support
OSHA Citations
OSHA Typical Standards Cited
National Emphasis Program (NEP) - Refineries

• 1910.119  PSM – 249 violations
• 1910.147  Lockout/Tagout - 20
• 1910.120  HAZWOPER - 19
• 1910.1200 HAZCOM - 12
• 1910.146  Confined Space - 11
• 5A.001    General Duty - 9
• 1910.307  Hazardous Locations - 7
OSHA Refining NEP PSM Enforcement Statistics

Based on 65 NEP Inspections:

Total Citations = 1,542
- PSM 1088 (70%)
- Non-PSM 454 (30%)

Total Fines = $9,401,472.00 ($ = pre-2016)

INCREASES – Potential 2016 Maximum Penalties
*assumes 80% catch-up adjustment

<table>
<thead>
<tr>
<th>Violation Type</th>
<th>Current Maximum Penalty</th>
<th>2016 Maximum Penalty*</th>
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</thead>
<tbody>
<tr>
<td>Other than Serious Violations</td>
<td>$7,000</td>
<td>$12,600</td>
</tr>
<tr>
<td>Serious Violation</td>
<td>$7,000</td>
<td>$12,600</td>
</tr>
<tr>
<td>Willful Violation</td>
<td>$70,000</td>
<td>$126,000</td>
</tr>
<tr>
<td>Repeat Violation</td>
<td>$70,000</td>
<td>$126,000</td>
</tr>
</tbody>
</table>
# OSHA Refining NEP PSM Enforcement Statistics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Integrity</td>
<td>202</td>
</tr>
<tr>
<td>Process Safety Information</td>
<td>189</td>
</tr>
<tr>
<td>Process Hazard Analysis</td>
<td>188</td>
</tr>
<tr>
<td>Operating Procedures</td>
<td>184</td>
</tr>
<tr>
<td>Management of Change</td>
<td>92</td>
</tr>
<tr>
<td>Incident Investigation</td>
<td>71</td>
</tr>
<tr>
<td>Compliance Audits</td>
<td>47</td>
</tr>
<tr>
<td>Contractors</td>
<td>33</td>
</tr>
<tr>
<td>Training</td>
<td>29</td>
</tr>
</tbody>
</table>

Total: 855 incidents, 79%
# OSHA Refining NEP PSM Enforcement Statistics

<table>
<thead>
<tr>
<th>Category</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Planning and Response</td>
<td>17</td>
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<tr>
<td>Employee Participation</td>
<td>15</td>
</tr>
<tr>
<td>Pre-Startup Safety Review</td>
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</tr>
<tr>
<td>Hot Work Permits</td>
<td>8</td>
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<tr>
<td>Trade Secrets</td>
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</tr>
</tbody>
</table>

Total PSM Citations: 1088
Mechanical Integrity

- Pressure Vessels
- Relief Valves
- Weld Quality Control Program
- Piping Inspection
- INSPECTOR CERTIFICATIONS
- Tank Reliability
- Electrical Instrumentation, Emergency Shutdown (ESD)
- Acoustic Emissions (AE) Tests Replications
- Exchanger Reliability
- Turnaround Inspections
- Heater Reliability
- MAINTENANCE TRAINING & CERTIFICATION

Drill & Tap?
### OSHA NEP Enforcement Statistics

#### Mechanical Integrity

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
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<tbody>
<tr>
<td>J(1)</td>
<td>Process equipment</td>
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<tr>
<td>J(2)</td>
<td>Written procedures</td>
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<td>J(3)</td>
<td>Training</td>
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<tr>
<td>J(4)</td>
<td>Inspection and testing</td>
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<td>J(4)(i)</td>
<td>Inspection and testing</td>
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<td>J(4)(ii)</td>
<td>Engineering practices</td>
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<td>J(4)(iii)</td>
<td>Frequency</td>
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<td>J(4)(iv)</td>
<td>Documentation</td>
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<td>J(5)</td>
<td>Equipment deficiencies</td>
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<td>J(6)(i)</td>
<td>Quality assurance</td>
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<td>J(6)(ii)</td>
<td>Inspections</td>
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<tr>
<td>J(6)(iii)</td>
<td>Materials and spare parts</td>
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</tr>
</tbody>
</table>

**TOTAL**: 202
(J-2) Mechanical Integrity Program
No Procedures exist for:

- Pressure vessels with integrally bonded liners
- Corrosion under insulation inspections for pressure vessels and piping
- Addressing anomalous readings pertaining to metal thickness
- Determining thickness measurement frequency for pressure vessels
- Determining the representative number of thickness measurements
OSHA NEP Enforcement Statistics

(J-4) Testing and Inspections
Failure to follow own scheduled T/I Visual inspections
- Ultra sound
- Internal corrosion
- Total Mass Losses (TMLs)
- Vibration analysis

Failure to follow RAGAGEP Testing of wrong locations
- Testing at wrong frequencies
- Insufficient number of tests

Failure to document the T/I results

Note: OSHA Enforcement of ‘RAGAGEP’
OSHA Adoption of the 1% Rule

Similar to EPA 1% Rule

• Federal Register, dated 7/18/2016
• The 1% test states that any Appendix A HHC in a process contributes to the threshold quantity (TQ) if it is in a mixture at concentrations greater than 1%, and that only the contained amount of the HHC counts toward the TQ, not the entire quantity of the mixture.

• Two important exceptions to this rule
  – First, the quantity in the mixture does not count if the partial vapor pressure of the HHC is less than 10 mm Hg.
  – Second, the 1% rule does not apply if the HHC has a mixture concentration associated with its listing.

• Beginning next April 1 and going to the end of March 2018, processes newly covered because of the new 1% test will not be cited if the employer is making a good faith effort to get in compliance

For more information:
Effective July 20, 2016

The Department will transition to the:
- Revised CSAT Top-Screen application
- Revised CSAT Security Vulnerability Assessment (SVA) application
- Revised CSAT Site Security Plan (SSP) application

CSAT 2.0 minimizes undue effort and unnecessary complexity that could inadvertently cause confusion

The transition from the existing CSAT applications to CSAT 2.0 is a three-step process.
- The first step is to temporarily suspend, effective July 20, 2016, the requirement for CFATS chemical facilities of interest to submit a Top-Screen and SVA
- The second step will be to replace the current CSAT Top-Screen, SVA, and SSP applications with CSAT 2.0 (i.e., the revised CSAT Top-Screen, SVA, and SSP applications)
- The third step will be to reinstate the Top-Screen and SVA submission requirements in 6 CFR 27.210(a) on October 1, 2016.

For more information: www.dhs.gov/chemicalsecurity
CFATS Quarterly: CFATSUpdate@hq.dhs.gov
Offeror - Refinery, Gas Plant, Pipeline Terminal

“… the offeror must ensure that enough odorant will remain in the cargo tank or portable tank during the course of transportation.

Shipper - Refinery, Gas Plant, Pipeline Terminal

• “The shipper must have procedures in place…”
• Quantitative testing methods to measure odorant
• Manual injection of required amount of odorant
• Automatic injection of required amount of odorant, including calibration checks
• Notify persons who receive cargo tanks or portable tanks of:
  – Conditions that could lead to corrosion of tanks
  – New tanks
  – Recently cleaned tanks
• Inspection of cargo tank or portable tank for signs of oxidation or corrosion
• Corrective actions to ensure enough odorization remains in tank car during course of transportation
Odorization Exception

Exception

“odorization is not required if it is harmful in the use or further processing of the liquefied petroleum gas or if it will serve no useful purpose as a warning agent in such use or further processing.”
Summary

- OSHA’s Process Safety Management (PSM) equivalent to EPA’s Risk Management Program 3 OR Company Operational Excellence programs – expect external Agency audits to be similar.
- Center for Chemical Process Safety (CCPS) 20 Management System Elements – Worthwhile to review additional process management elements
- Recognized and Generally Accepted Good Engineering Practice (RAGAGEP) Respect – Select appropriate RAGAGEP and internal ‘Should/Shall’ Language
- Mechanical Integrity (MI) Programs – Increase FULL ownership of assets
- DHS CFAT 2.0 Topscreen Resubmissions – CSAT>SVA>SSP – Begin gathering facility information for resubmission of CSAT 2.0 Topscreens.
- DOT 49 CFR – Propane / NGL Odorization Regulation (No longer an NFPA RAGAGEP) – Set up responsible of ownership of product mercaptan injection systems, Operator and Maintenance training programs
People and Property Ownership

Across the Various Design and O&M Layers
Questions?
THANK YOU!

Brett A. Wheelock CSP, CHMM, REM, CEA, ARM
Manager, Regulatory Compliance
ONEOK Partners – NGGP
918.591.5149 Office  Brett.Wheelock@ONEOK.com