

2009 Central Valley Chemical Safety Day

CalARP/RMP/PSM Five-Year Update
(Critical Elements, Focusing, Timing)

Steven T. Maher, PE CSP
Risk Management Professionals

949/282-0123

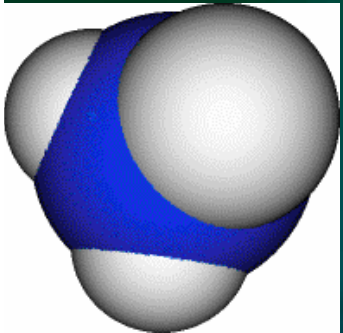
www.RMPCorp.com

Agenda

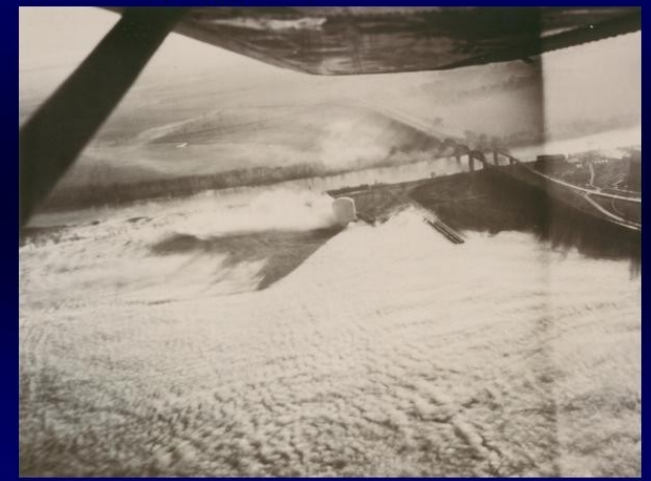
- Regulatory Process Safety Programs that Require 5-Year Updates
- Key Elements of US EPA RMP & CalARP
- Prevention Program Comparison
- CalARP/RMP/PSM Key Periodic Requirements
- Pacing Yourself for the 5-Year Updates
- What To Do If Starting Late
- Key Requirements of CalARP, PSM, & RMP
- Regulatory Challenges
 - Common Deficiencies
 - Miscellaneous Oversights & Challenges
 - Select Citation Summary

Regulatory Process Safety Programs that Require 5-Year Updates

- California Accidental Release Prevention (CalARP) Program
 - Ammonia Threshold = **500#**
- EPA Risk Management Program (RMP)
 - Ammonia Threshold = **10,000#**
- Cal/OSHA Process Safety Management (PSM) Program
 - Ammonia Threshold = **10,000#**



Anhydrous Ammonia spill, Blair, NE, 1970
(ground-hugging plume)



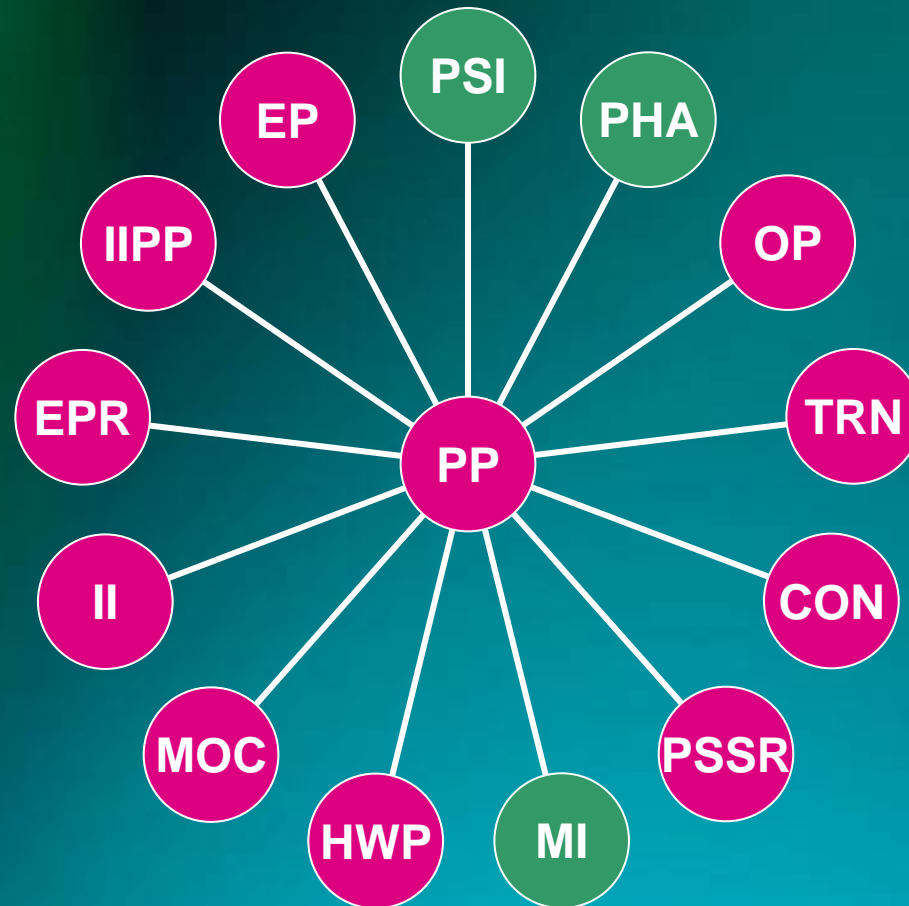
Key Elements of US EPA RMP & CalARP

- **Hazard Assessment** (potential hazards to the community)
 - Estimate Potential Release Quantities
 - Determine Downwind Effects
 - Evaluate Scenarios Ranging from Probable/Low-Impact to Improbable/Worst-Case
 - Potential Exposure to Affected Populations Under Worst-Case Conditions
 - Accident History for Previous Five Years
- **Prevention Program** (Prevention Program 3 primarily encompasses PSM elements; however, the differences in the lists of regulated substances and the threshold quantities result in additional facilities covered by the RMP Rule)

Key Elements of US EPA RMP & CalARP

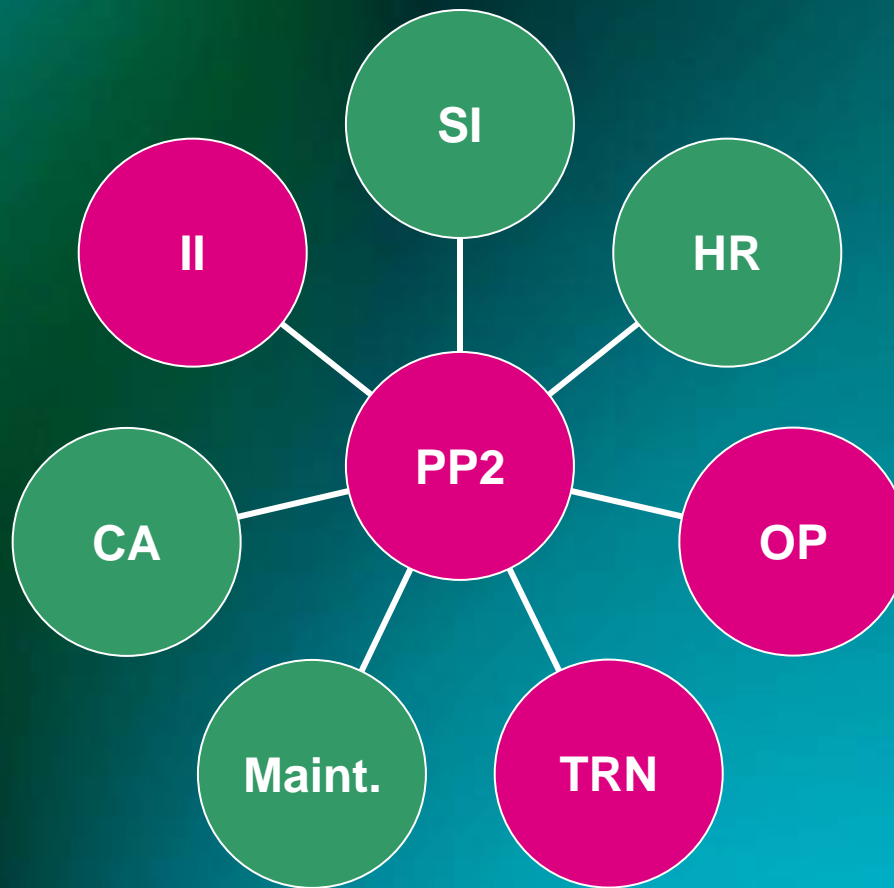
- **Emergency Response Program**
 - Considers Magnitude of Potential Release and Possible Community Impacts
 - Protective Actions to Protect Humans, Health, and the Environment
 - > On-site mitigation
 - > Off-site emergency response
 - > Community alert & response
 - Coordination with Local Emergency Planning Committee
 - Employee Training

Elements of PSM (California)



CalARP/RMP Program 2

Prevention Program

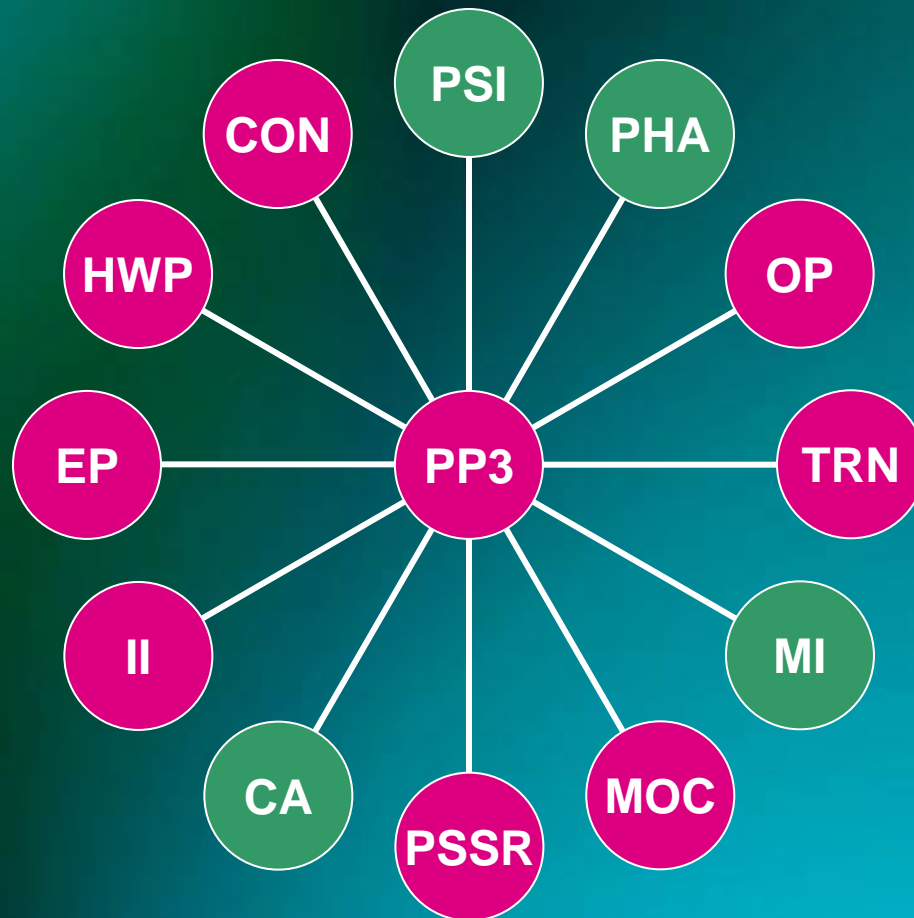


Other Elements

- Hazard Assessment
- Seismic Safety Assessment / Walkdown
- Submittal Formulation

CalARP/RMP Program 3

Prevention Program



Other Elements

- Hazard Assessment
- Seismic Safety Assessment / Walkdown
- Submittal Formulation

Prevention Program Comparison

Section	EPA (40 CFR) (P3)	OSHA (29 CFR)	Cal/OSHA (8 CCR)	CalARP (19 CCR) (P3)
Trade Secrets		1910.119 (p)		
Process Safety Information	68.65	1910.119 (d)	5189 (d)	2760.1
Process Hazard Analysis	68.67	1910.119 (e)	5189 (e)	2760.2
Operating Procedures	68.69	1910.119 (f)	5189 (f)	2760.3
Training	68.71	1910.119 (g)	5189 (g)	2760.4
Mechanical Integrity	68.73	1910.119 (j)	5189 (j)	2760.5
Management of Change	68.75	1910.119 (l)	5189 (l)	2760.6
Pre-Startup Safety Review	68.77	1910.119 (i)	5189 (i)	2760.7
Compliance Audits	68.79	1910.119 (o)	[IIPP]	2760.8
Incident Investigation	68.81	1910.119 (m)	5189 (m)	2760.9
Employee Participation	68.83	1910.119 (c)	5189 (p)	2760.10
Hot Work Permit	68.85	1910.119 (k)	5189 (k)	2760.11
Contractors	68.87	1910.119 (h)	5189 (h)	2760.12
Emergency Response Program	68.95	1910.119 (n)	5189 (n)	Article 7

CalARP/PSM/RMP Key Periodic Requirements

- **Five-Year**
 - SI (2) / PSI (3)
 - HR (2) / PHA (3)
 - RMP Submittal
 - Hazard Assessment
 - External Events Review (CalARP-Only)
- **Triennial**
 - Training
 - Compliance Audit
 - Hazardous Materials Business Plan

CalARP/PSM/RMP Key Periodic Requirements

- **Annual**
 - Operating Procedures
 - Emergency Planning & Response
 - IIPP
- **Non-Specific**
 - Maintenance (2) / Mechanical Integrity (3)
 - Incident Investigation
 - MOC (PSM & Program 3 Only)
 - PSSR (PSM & Program 3 Only)
 - Hot Work Permit (PSM & Program 3 Only)
 - Contractor Safety & Qualification (PSM & Program 3 Only)
- **Changes in Design or Operation !!**

Pacing Yourself for the 5-Year Updates

T – 2 Months

T – 1 Month

■ Arrange for Any Needed CalARP/RMP/PSM Contractor Support

■ Project Start and Initial Information Gathering

■ Arrange for CUPA Support

■ Project Kickoff Meeting & Information Gathering

■ PSI/SI Creation / Update

Misc. Prev. Prog. 2 Elements: OP, TRN, Maint., CA, II
Misc. Prev. Prog. 3 Elements: OP, TRN, MI,
MOC, PSSR, CA, II, EP, HWP, CON


■ Prevention Program Element Review & Summary for RMP Submittal

HA & Draft for Review


Pacing Yourself for the 5-Year Updates

T – 1 Month


T


 Work with CUPA to Determine Need for Seismic Safety Assessment/Walkdown

 Site Visits for PHA/HR


 PHA/HR Report & Draft for Review

 Site Visits for Seismic Safety Assessment/Walkdown

 Seismic Report & Draft for Review

 On-Site CalARP / RMP / PSM Training

RMP Submittal Draft for Review 

Finalization of All Work
Products & Submittal 

What To Do If Starting Late

- **Combining Consultant Site Activities**
- **Running Tasks In Parallel**
- **Communicating with the CUPA**



Key Requirements of CalARP, PSM, & RMP



See Ref. 2 & 5
for Additional
Information

Common Deficiencies

(from RMP observations and Ref. 3)

- **Operating Procedures (OP)**
 - Written procedures not synchronized with Operator actions
 - Each phase of operation not listed
 - Emergency shutdown procedure job assignments not clear
 - Temporary operations not included
- **Process Safety Information (PSI)**
 - Piping & Instrumentation Diagrams (P&IDs) missing or not current
 - PSI not properly filed, managed, or available
 - Relief system design or design basis not documented
 - Compliance with recognized and generally-accepted good engineering practices not documented
 - Electrical area classifications not documented
 - Chemical reactivity hazard evaluations not documented

Common Deficiencies

- **Process Hazard Analysis (PHA)**
 - Five-year updates not done on-time
 - Recommendations not closed or closure not documented
 - Human factors or facility siting not addressed in report
 - Facility siting not based on current design codes & standards
- **Mechanical Integrity (MI)**
 - Written procedures related to the ongoing integrity of the process not available
 - Inspections are not occurring or inspection frequency is not consistent with industry standards
 - Equipment deficiencies not corrected in a safe or timely manner
 - Facility relies on a Contractor and does not have a written preventive maintenance schedule that it is committed to

Common Deficiencies

- **Incident Investigation (II)**
 - Incident investigations not done correctly
 - Lack of follow-through on recommendations
 - Findings not shared with affected employees
- **Employee Participation (EP)**
 - Written plan not shared with employees
 - Employees involved in the covered process do not know where PSM/RMP documentation is located
- **Compliance Audits (CA)**
 - Lack of follow-through on recommendations
 - Inspection of electrical equipment in hazardous areas not conducted to verify compliance with 1910.302-308

Common Deficiencies

- **Training (TRN)**

- Documentation that demonstrates that training has been performed not available
- Personal protective equipment (PPE) procedures and training documentation not available or procedures not followed

- **Hot Work Permit (HWP)**

- Employees not trained or knowledgeable in the procedures
- Safe work practices (e.g., LO/TO, HWP, Confined-Space Entry, Line Breaking) not followed (employees or contractors)

- **Management of Change (MOC)**

- MOC Procedure not current or used
- Prevention Program documentation not updated to reflect a change in the system

Common Deficiencies

- **Pre-Startup Safety Review (PSSR)**
 - Written procedures do not exist
- **Contractors (CON)**
 - Lack of documentation on contractors that the facility is known to frequently use for handling maintenance or construction

Most common program-wide deficiency:
ADDRESSING RECOMMENDATIONS

Process Hazard Analysis Recommendations

Federal OSHA has the following guidance for Process Hazard Analysis findings:

An employer can justifiably decline to adopt a recommendation where the employer, can document, in writing and based upon adequate evidence, that one or more of the following conditions is true:

- 1.** The analysis upon which the recommendation is based contains factual errors.
- 2.** The recommendation is not necessary to protect the health and safety of employees and contractors.
- 3.** An alternative measure would provide a sufficient level of protection.
- 4.** The recommendation is infeasible.

Recommendation Follow-up Basics

- Assign an individual responsible for following up on the recommendation.
- Assign a target date of completion to each and every recommendation.
- Document the actions taken for addressing the recommendation, label it as “CLOSED,” and document the date of completion.

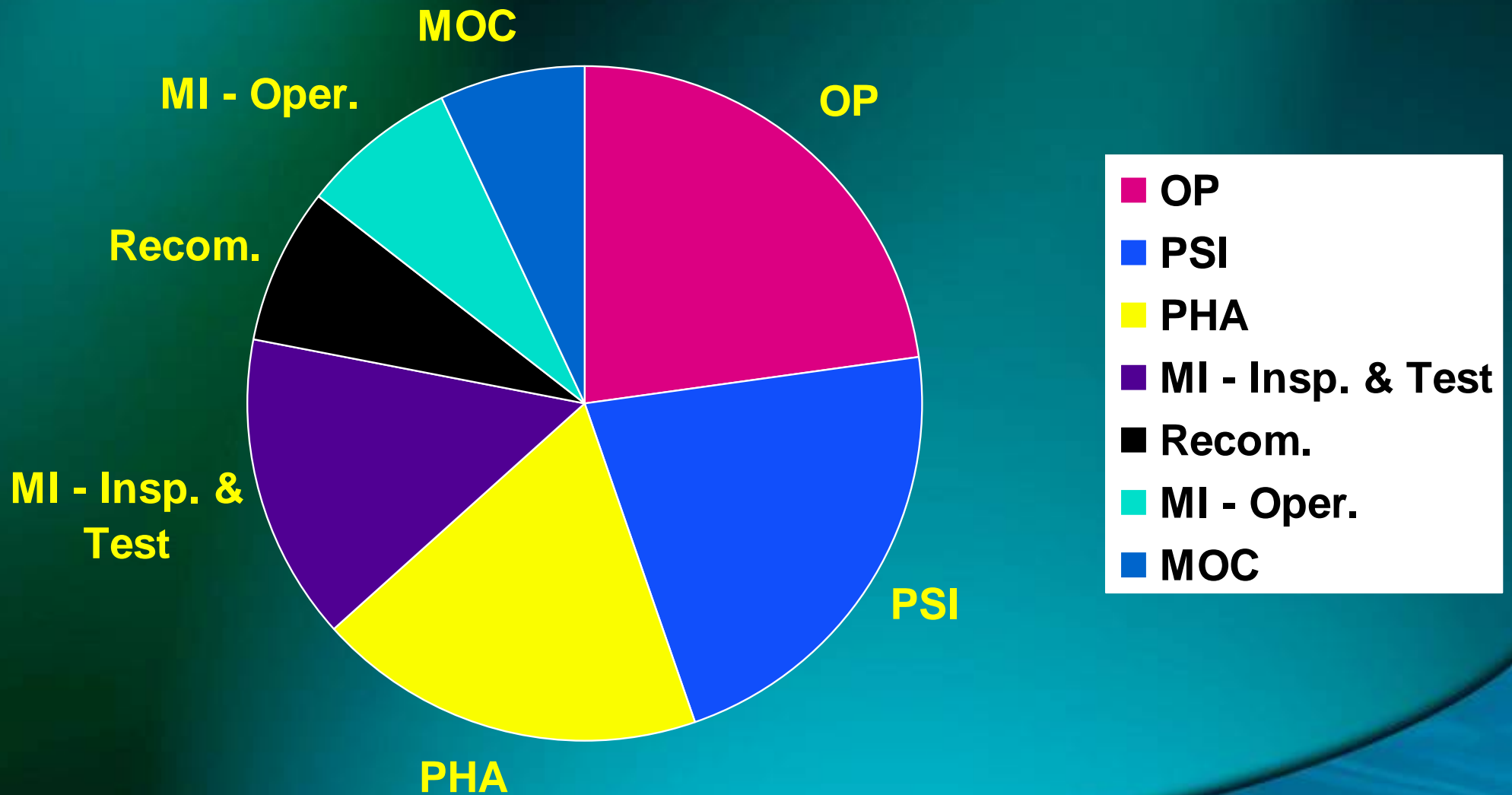
Miscellaneous Oversights & Challenges

- Installation & Maintenance Contractors Not Communicating the Regulatory Impact of Ammonia Inventories to Owners
- Early Communication with Regulators
- Obtaining Design & Project Files from Contractors
- IIAR and Other Industry Requirements Citable by Regulators

Select Citation Summary (Ref. 3)

- **516** - Total Number of Citations Issued to Refinery Employers
- **361** – Total PSM Citations
- **9** – Significant Enforcement Cases
- **8** – Willful Violations
- **459** – Serious Violations
- **8** – Repeat Violations
- **14** – Unclassified Violations
- **15** – Other Violations
- **\$2,709,000.00** – Total Penalties Assessed

Select Citation Summary (Ref. 3)



References

1. www.RMPCorp.com/LinkedFiles/EAPvsERP.English.pdf - “Ammonia Refrigeration System Emergency Action Plans vs. Emergency Response Plans,” presented at the 2006 RETA Annual Meeting.
2. www.RMPCorp.com/LinkedFiles/RegulatoryOverviewAndRMPAndBestPractices.pdf - “Process Safety Regulations and Prevention Program Overview”.
3. Steinway, Seitz, Perry, and Siegel, “Before OSHA Comes Knocking ...,” Chemical Engineering Progress, March 2009.
4. www.RMPCorp.com/LinkedFiles/EAPvsERP.Maher.Monge.Hall.Adams.05Aug06.pdf - Maher, Monge, Hall, Adams - “Ammonia Refrigeration System Emergency Action Plans vs. Emergency Response Plans (Requirements and Ramifications)”.
5. www.RMPCorp.com/LinkedFiles/ComplianceAuditsMadeEasy.pdf - “Compliance Audits Made Easy”.