CalARP/RMP/PSM Program Deficiencies and Your 5-Year Update

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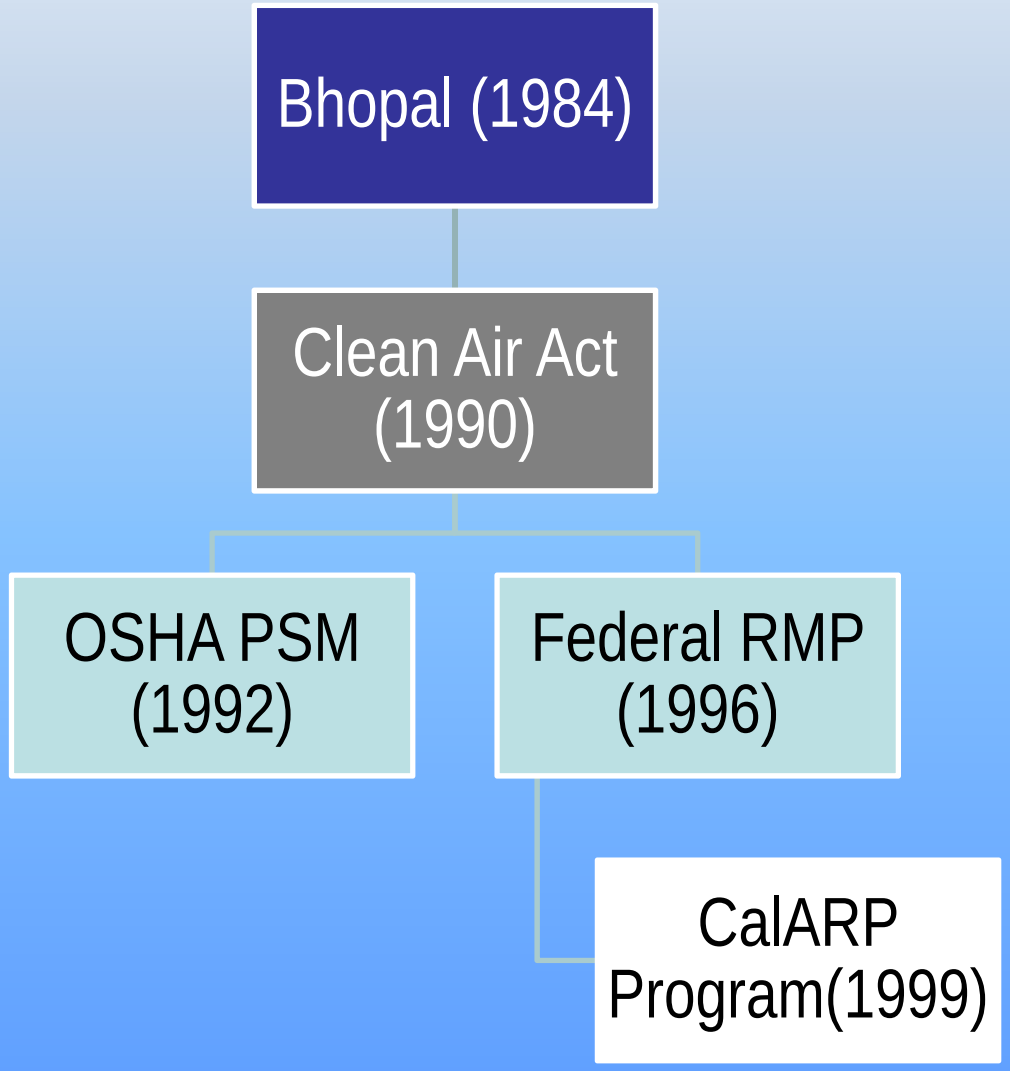
Outline

- Regulatory Initiatives
- Program Descriptions
- CalARP/RMP/PSM Program Elements
  - Hazard Assessment Overview and Deficiencies
  - Prevent Program Elements
    - Element Descriptions
    - Common Deficiencies
- Periodic Requirements and Program Lifecycle

Regulatory Initiatives

Regulatory Initiative Matrix



Regulatory Initiatives – Federal

- Regulatory Requirements:
  - Code of Federal Regulations, Title 29, Subtitle B, Chapter XVII, Part 1910; “Occupational Safety and Health Standards”; July 2011
  - Code of Federal Regulations, Title 40, Chapter 1, Part 68; “Chemical Accident Prevention Provisions”; July 2012.
- Two Federal lists for regulated substances
  - Federal Regulated Toxic Substances List
  - Federal Regulated Flammable Substances List
- Updated/reviewed annually (http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR)

Regulatory Initiatives – California

- Regulatory Requirements:
  - California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 7, Group 16, Article 109 (Section 5189); "Process Safety Management of Acutely Hazardous Materials"; September 2012.
  - California Code of Regulations, Title 19, Division 2, Chapter 4.5, Article 1 to Article 11 (Section 2735 to Section 2785); "California Accidental Release Prevention (CalARP) Program Detailed Analysis"; May 2010.
- One State Regulated Substances List
- Updated weekly (http://government.westlaw.com/linkedslice/default.asp?RS=GVT1.0&VR=2.0&SP=CCR-1000&Action=Welcome)
- Administered by local Certified Unified Program Agency (CUPA)/Administering Agency (AA)

CalARP Proposed Amendment 2013

- On September 20, 2013, a Notice of Proposed Amendment was issued by the Office of Administrative Law
- Proposed changes to the regulation:
  - Petition Process:
    - Appendix A, Table 3 of the regulation contains 200 listed chemicals for which CalARP reporting is required at listed thresholds
    - A petition process is proposed for any person to propose changes to Table 3, either to raise or lower the threshold amount, or to either add or delete a chemical
  - Addition of endpoints:
    - Pertains to Table 3 in Appendix A
    - Proposition adds a full set of toxic endpoints for all 200 listed chemicals as provided by the Office of Environmental health Hazard Assessment (19 CCR 2750.2)
- For more information, see http://www.oal.ca.gov/res/docs/pdf/notice/38z-2013.pdf

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Who is Required to Submit?

- Any facility having a hazardous substance over the state threshold is required by the State of California to develop a California Accidental Release Prevention (CalARP) Program

- Those facilities meeting the Environmental Protection Agencies (EPA) Risk Management Plan (RMP) threshold quantities also must submit to the EPA

Regulated Substances Threshold Values

Regulated Substance	CalOSHA PSM (8 CCR § 5189)	US EPA RMP (40 CFR §68.130)	CalARP Program (19 CCR §2770.5)
Anhydrous Ammonia	10,000 pounds	10,000 pounds	500 pounds
Ammonia Solutions	15,000 pounds (44% Concentration or greater)	20,000 pounds (20% Concentration or greater)	500 pounds (All concentrations)
Chlorine	1,500 pounds	2,500 pounds	100 pounds
Sulfur Dioxide	1,000 pounds (Liquid)	5,000 pounds (Anhydrous)	500 (Anhydrous)
Formaldehyde	1,000 pounds	15,000 pounds	500 pounds
Nitric Acid	500 pounds (94.5% by Weight or greater)	15,000 pounds (80% Concentration or greater)	1,000 pounds

Acronyms

CalARP: California Accidental Release Prevention
CalOSHA: California Occupational Safety and Health Administration
PSM: Process Safety Management
RMP: Risk Management Plan
US EPA: United States Environmental Protection Agency

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Program Descriptions

CalARP/RMP Program Level 1

- Least stringent requirements
- Eligibility requirements:
  - For five years prior to RMP submission, accidental release has not occurred which resulted in off-site death, injury, or response and restoration activities
  - Based on toxic and/or flammability endpoints, worst-case release scenario would not impact public receptors
  - Emergency response procedures have been coordinated with the local emergency planning and response organizations

CalARP/RMP Program Level 1

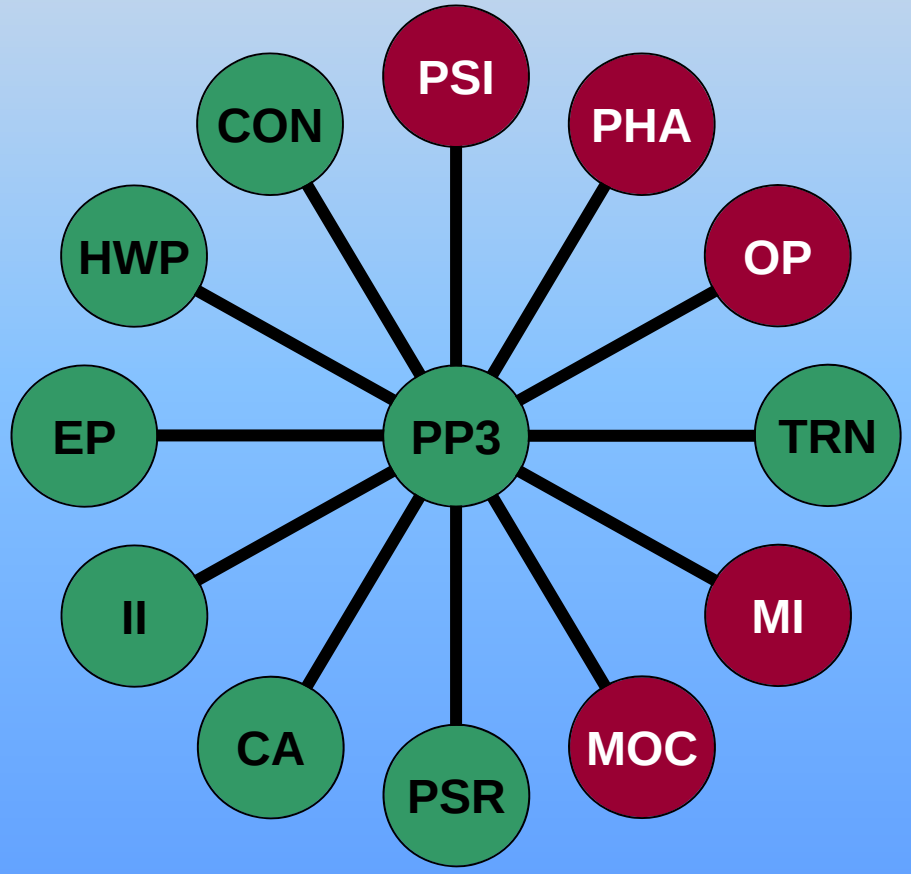
- Program Requirements:
  - Worst-case scenario analysis
  - Five-year accident history
  - Certification that no additional prevention steps are necessary
  - Coordinate with local emergency responders

CalARP/RMP Program Level 3

- Most stringent requirements - program requirements analogous to Process Safety Management (PSM)
- Eligibility requirements:
  - Process not covered under Program 1
  - One of the following:
    - Process in NAICS code 32211, 32411, 32511, 325181, 325188, 325192, 325199, 325211, 325311, or 32532
    - Process subject to 29 CFR 1910.119 (PSM)
    - AA determination

CalARP/RMP Program Level 3

Prevention Program



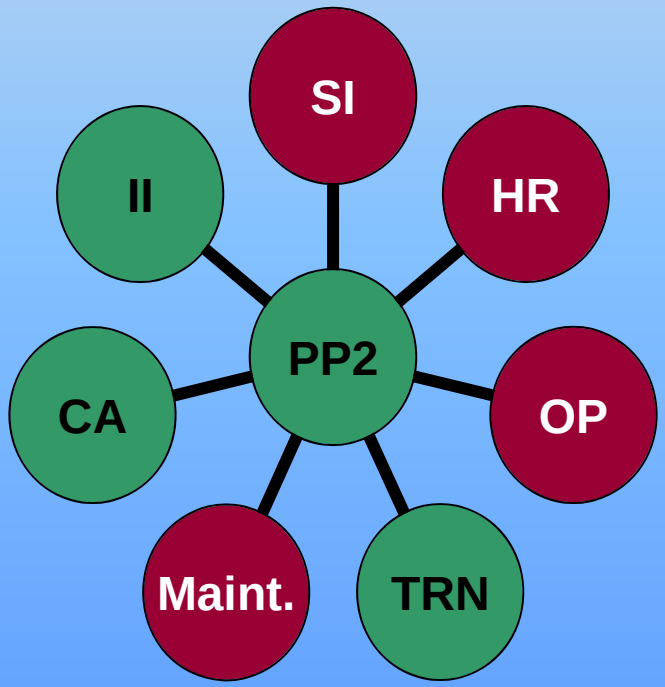
Other Elements

- Hazard Assessment
- Seismic Safety Assessment / Walkdown
- Submittal Formulation
- Emergency Response Program

CalARP/RMP Program Level 2

- Process not covered under Program 1 or Program 3

Prevention Program



Other Elements

- Hazard Assessment
- Seismic Safety Assessment / Walkdown
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- Emergency Response Program

Hazard Assessment Overview

Hazard Assessment (HA) Elements

- Offsite Consequence Analysis (includes population data and dispersion modeling)
  - Worst-Case and Alternative Release Scenarios required for Program 2 or 3
  - An EPA approved dispersion modeling software should be used (e.g., RMP*Comp)
  - Population data can be retrieved from census modeling software (e.g., MARPLOT)
- Five-Year Accident History

When Do I Resubmit?

- By the Five Year Anniversary date

OR

- Change in inventory that altered the Offsite Consequence Analysis distance by a factor of two (i.e., 1 mile to 2 miles)
- Ownership changes, emergency contact, or CalARP/RMP Coordinator changes
- A reportable incident has occurred
- Other

Submittal and HA Common Deficiencies

- CalARP/RMP Submittal
  - CalARP/RMP submittal (or RMP*eSubmit) not completed and submitted to agency when necessary
  - Management System is not in place
- Hazard Assessment
  - Description of scenario selection is not available
  - Revalidation: Failure to update populations, sensitive receptors, and maps

Prevention Program Overview and Common Deficiencies

RMP/PSM/CalARP Program 3 Prevention Program Requirements

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

Program requirements can be compiled into one cohesive document to meet requirements established by all agencies.

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Process Safety Information (PSI)

Information pertaining to the hazards of the regulated substances in the process:

- Toxicity Information; Permissible exposure limits; Physical data; Reactivity data; Corrosivity data;
- Thermal and chemical stability data; and
- Hazardous effects of inadvertent mixing of different materials that could foreseeable occur

Information concerning the technology of the process:

- A block flow diagram or simplified process flow diagram;
- Process chemistry;
- Maximum intended inventory;
- Safe upper and lower limits for such items as temperatures, pressures, flows or compositions; and
- An evaluation of the consequences of deviations

Information pertaining to process equipment :

- Materials of construction;
- Piping and instrument diagrams (P&IDs);
- Electrical classification;
- Relief system design and design basis;
- Ventilation system design;
- Design codes and standards employed;
- Material and energy balances; and
- Safety systems (interlocks, detection, or suppression)

PSI Common Deficiencies

- Piping and Instrumentation Diagrams (P&IDs) are missing or do not reflect changes that have been made to the system
- Relief system design or design basis not documented
- Compliance with recognized and generally-accepted good engineering practices not documented
- Electrical area classifications and electrical distribution system not documented
- Chemical reactivity hazard evaluations not documented
- Codes and standards used in the design not documented

Process Hazard Analysis (PHA)

- Systematic effort to identify hazards of the process chemical, operations including human factors and facility siting issues, and external events that could affect the facility
- Identifies range of health and safety effects
- Lists the worst-case consequences
- Identifies the safeguards in place
- Provides an objective method to measure the effectiveness of safeguards and need for additional safeties

PHA Common Deficiencies

- Recommendations not closed or closure not documented
- Five-year updates not done on-time
- Human factors or facility siting not addressed in report
- Facility siting not based on current design codes & standards
- Industry-accepted approach not used, or not used correctly
- Inconsistent consideration of scenarios and risk-ranking
- External events, including seismic, not addressed

Operating Procedures (OP)

- Written procedures that provide clear instruction to conduct activities involved in each process
- Advantages are standardized and safe operating procedures
- Required Operating Procedure Modes:
  - Initial startup;
  - Normal operations;
  - Temporary operations;
  - Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner;
  - Emergency operations;
  - Normal shutdown; and,
  - Startup following a turnaround, or after an emergency shutdown.

Operating Procedures (OP)

- Operating Limits:
  - Consequences of deviation
  - Steps required to correct or avoid deviations
- Safety and Health Considerations:
  - Properties of, and hazards presented by, the chemicals used in the process
  - Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment
  - Control measures to be taken if physical contact or airborne exposure occurs

OP Common Deficiencies

- Procedure outdated or annual review/certification not performed
- Written procedures not synchronized with Operator actions
- Each phase of operation not listed
- Emergency shutdown procedure job assignments not clear
- Temporary operations not included
- Acceptable alarm set point range not documented
- Procedures not in the language of the user
- Safe work practices (e.g., LO/TO, HWP, Confined-Space Entry, Line Breaking) not followed

Training (TRN)

- Describes how the employees must be provided appropriate training in applicable tasks and procedures to enable them to perform their jobs safely and effectively under a variety of operating conditions
- The initial documented operator training must include:
  - Safety & health hazards
  - Emergency operations including shutdown
  - Safe work practices applicable to the operator's assigned job task
  - Safety systems & their functions
  - Operating limits, the consequences of deviating from the operating limits or procedures
- The training records must include:
  - The identity of the operator trained
  - The date of the training
  - The means used to verify that the training was received & understood by the employee

TRN Common Deficiencies

- Documentation that demonstrates that training has been performed not available
- Training does not cover maintenance procedures
- Training records do not indicate the means used to verify that the employee understood the training
- Training not in the language of the user

Mechanical Integrity (MI)

- Describes the process and safety equipment preventive maintenance and inspection schedules
- Cannot have a Fix-at-Failure Maintenance Strategy
- Must have a Preventive Maintenance program based on manufacturer recommendations
- If a contractor is used, you still must develop a written schedule of what he/she is replacing, overhauling, cleaning, etc. and on what frequency

MI Common Deficiencies

- Written procedures related to the ongoing integrity of the process not available, not complete, or not implemented
- Inspections/maintenance are not occurring or inspection/maintenance 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
- Quality Assurance not in place
- MI activity NOT DOCUMENTED!!!

Management of Change (MOC)

- Ensure a safe and systematic method is used to make changes to processes that contain highly hazardous materials
- Identify the technical basis for any proposed change
- Ensure that the changes have been designed utilizing good engineering practices and regulatory requirements
- Ensure all required modifications to operating procedures, process safety information, and/or other CalARP/RMP/PSM documentation have been made
- Inform and train involved employees of process change and new requirements

MOC Common Deficiencies

- MOC Procedure not current or used
- Prevention Program documentation not updated to reflect a change in the system
- Personnel are not adequately notified of change

Pre-Startup Review (PSR)

- Conducted for all new process construction and modified processes to ensure that the system is safe for initial and continued operation
- Confirms that elements of the Management of Change have been completed
- Ensures that PHA recommendations have been closed prior to startup

PSR Common Deficiencies

- Written procedures do not exist
- PSR documentation is not completed or kept on file following implementation of the MOC procedure
- Documentation is not completed, and signed-off, until after startup

Compliance Audits (CA)

CalARP/RMP/PSM have nearly identical requirements:

- Certify evaluation of CalARP/RMP/PSM compliance (CalARP/RMP explicitly requires completion of an compliance audit every 3 years)
- Document findings
- Address deficiencies
- Retain two most recent audit reports
- Can be addressed by developing checklists to address:
  - Technical compliance
  - Actual effectiveness
- This is NOT a CUPA, OSHA or EPA audit.

CA Common Deficiencies

- Lack of follow-through on recommendations
- Compliance audit not completed every three years
- Performing an audit of program, but not supporting with documentation
- Program implementation not verified with facility personnel

Incident Investigation (II)

- Written procedure for prompt reporting and investigation of every incident which resulted in or could have reasonably resulted in a major accident
- Describes the process of incident investigation
  - All incidents must be investigated and reported including near-miss incidents
  - Investigate the incident as promptly as possible (No later than 48 hours following the incident)
  - The report should be reviewed with all affected personnel including contract employees
- A “near miss” is considered an incident

Incident Investigation (II)

- The Incident Investigation report needs to include the following:
  - Date of incident
  - Date investigation began
  - A description of the incident
  - The factors that contributed to the incident (especially root causes)
  - Any recommendations resulting from the investigation

II Common Deficiencies

- Incident Investigation not performed or done correctly
- Incident Investigation team not formed within the first 48 hours of the incident
- Lack of follow-through on recommendations
- Findings not shared with affected employees

Employee Participation (EP)

- It is required that employees are consulted on the conduct and development of program elements
- Employees should have access to elements of the program
- Key to effective Employee Participation:
  - Ensure that a written plan of action is developed to insure that information regarding PHA and other elements of the RMP/PSM Program are communicated to affected employees and their representatives
  - Ensure that the PHA information and other information mentioned is easily available to the employees.

EP Common Deficiencies

- A written Employee Participation plan is not documented and shared with employees
- Employees involved in the covered process do not know where RMP/PSM documentation is located
- Employees not involved in Program development

Hot Work Permit (HWP)

- A procedure must be in place for issuing a hot work permit for each hot work operation conducted on or near the covered process
- The hot work permit must:
  - Document that the fire prevention & protection requirements as specified in 29 CFR §1910.252[a] have been implemented prior to commencing the hot work operations
  - Indicate the date(s) authorized for hot work
  - Indicate the object on which hot work is to be performed
  - Be kept on file until completion of the hot work operations

HWP Common Deficiencies

- Employees are not trained nor knowledgeable of the procedures
- Hot work records are not documented and kept on file

Contractors (CON)

- It is the responsibility of the facility to ensure that any contractor going to work on or near the regulated process is qualified and fully aware of the potential dangers involved with the system
  - The contractor owner or operator shall ensure that each contract employee is trained in safe work practices
  - Periodically evaluate the performance of the contract owner or operator, including training records and verifying safe work practices
- Maintains a procedure to procure, supervise, and evaluate contractors

CON Common Deficiencies

- Lack of documentation on contractors that the facility is known to frequently use for handling maintenance or construction
- Lack of Contractor/Visitor safety training
- Lack of periodic evaluation of contractors

Emergency Planning & Response (EP&R)

- If the facility is a first responder, an Emergency Response Program is required
- The owner or operator of a stationary source whose employees will not respond to accidental releases of regulated substances need not comply with the Emergency Response Program provided they meet the following:
  - For stationary sources with any regulated toxic substance held in a process above the threshold quantity, the stationary source is included in the community emergency response plan
  - For stationary sources with only regulated flammable substances held in a process above the threshold quantity, the owner or operator has coordinated response actions with the local fire department; and,
  - Appropriate mechanisms are in place to notify emergency responders when there is a need for a response

Emergency Action Plan (EAP)

- Establish an Emergency Action Plan (EAP) for the entire plant
- Plant personnel must NOT take response actions
- Employees must be trained in the evacuation procedures (including familiarization with the various alarms in use)

EP&R Common Deficiencies

- ERP vs. EAP
- Not up-to-date
- Phone numbers outdated
- Annual review not performed
- Training
- Physicals and fit testing
- Emergency response equipment

Trade Secrets

- If applicable for PSM requirements, “trade secrets” may not be claimed

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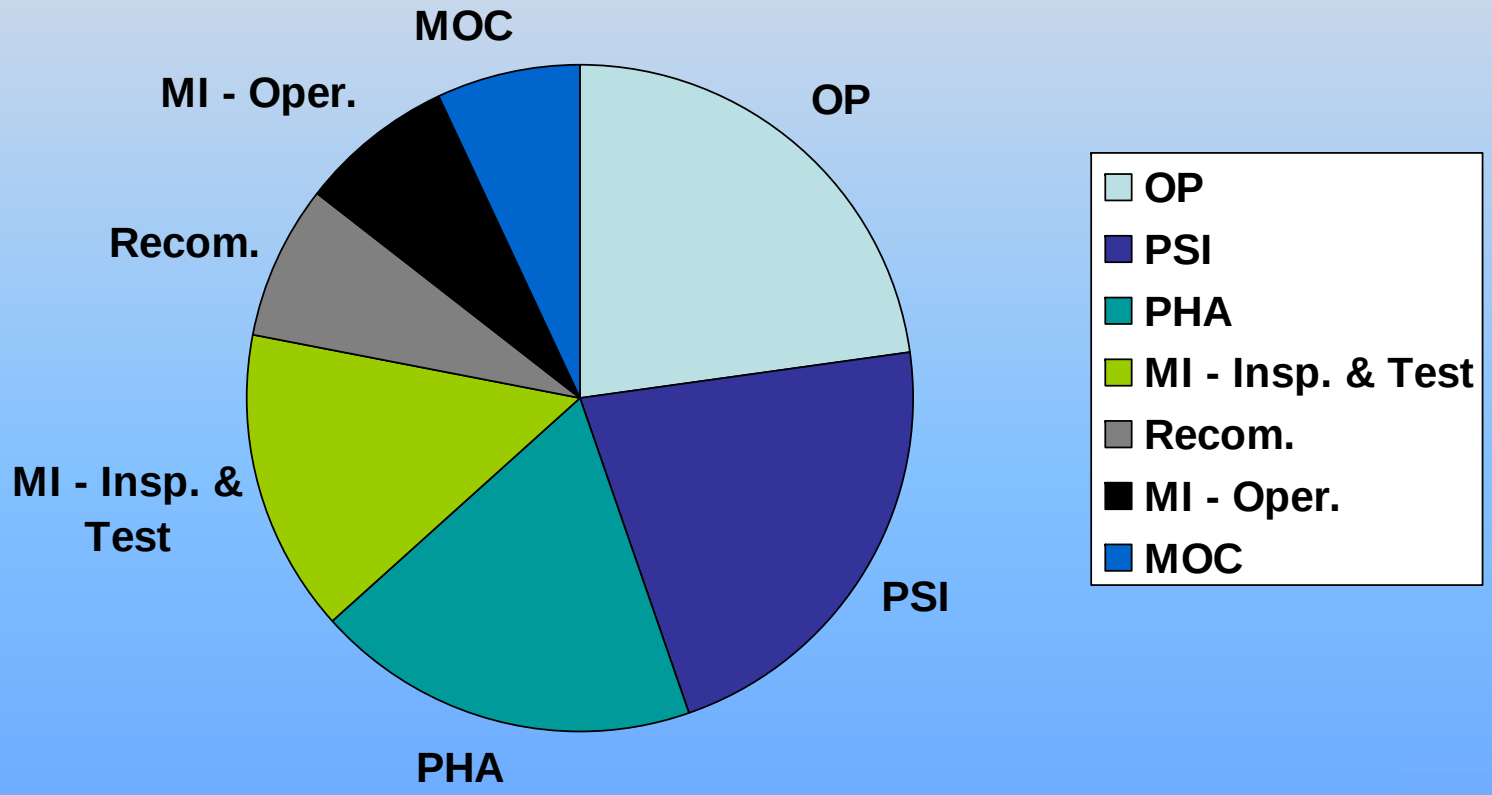

Steinway, Seitz, Perry, and Siegel, “Before OSHA Comes Knocking …,” Chemical Engineering Progress, March 2009.

Common Program Deficiencies

The most common program-wide deficiency:

ADDRESSING
RECOMMENDATIONS

Recommendation Follow-up

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

- Assign an individual responsible for following up on the recommendation
- Assign an anticipated date of completion to each and every recommendation
- Document the actions taken for addressing the recommendation, label it as “CLOSED” and state the date of completion
- Even if the facility performs all of the actions of their recommendations (i.e., installing sensors, labeling piping, etc.), if the documentation that originally stated the recommendations is not updated, it is a deficiency

Periodic Requirements and Program Life Cycle

CalARP/RMP/PSM Key Periodic Requirements

- Annual Review/Update
  - Operating Procedures
  - Emergency Action Plan or Emergency Response Plan
- Every 3-Years
  - Refresher Training
  - Compliance Audit (CalARP/RMP)
- Every 5-Years
  - CalARP/RMP Submittal
  - Hazard Assessment
  - Process Hazard Analysis (P3) or Hazard Review (P2)
  - External Events (CA only)
- Non-Incidental Changes in Design or Operation !!
  - Review of several elements, depending on change.

CalARP Program Maintenance

"CalARP Coordinator Program Maintenance"					
CalARP Program 3 Section	CalARP Coordinator Responsibility Program 3				Annual Review/Update
	Initial	Not-In-Kind Change to Process	Every Three Years	Every Five Years	
CalARP Submittal	✓	✓		✓	
Hazard Assessment	✓			✓	
Process Safety Information	✓	✓			
Process Hazards Analysis	✓	✓		✓	
Operating Procedures	✓	✓			✓
Training	✓	✓	✓		
Mechanical Integrity	✓	✓			
Management of Change	✓	✓			
Pre-Startup Safety Review	✓	✓			
Compliance Audit	✓		✓		
Incident Investigation	✓				
Hot Work Permit	✓				
Contractors	✓				
Emergency Action Plan	✓				✓
P & IDs	✓	✓			

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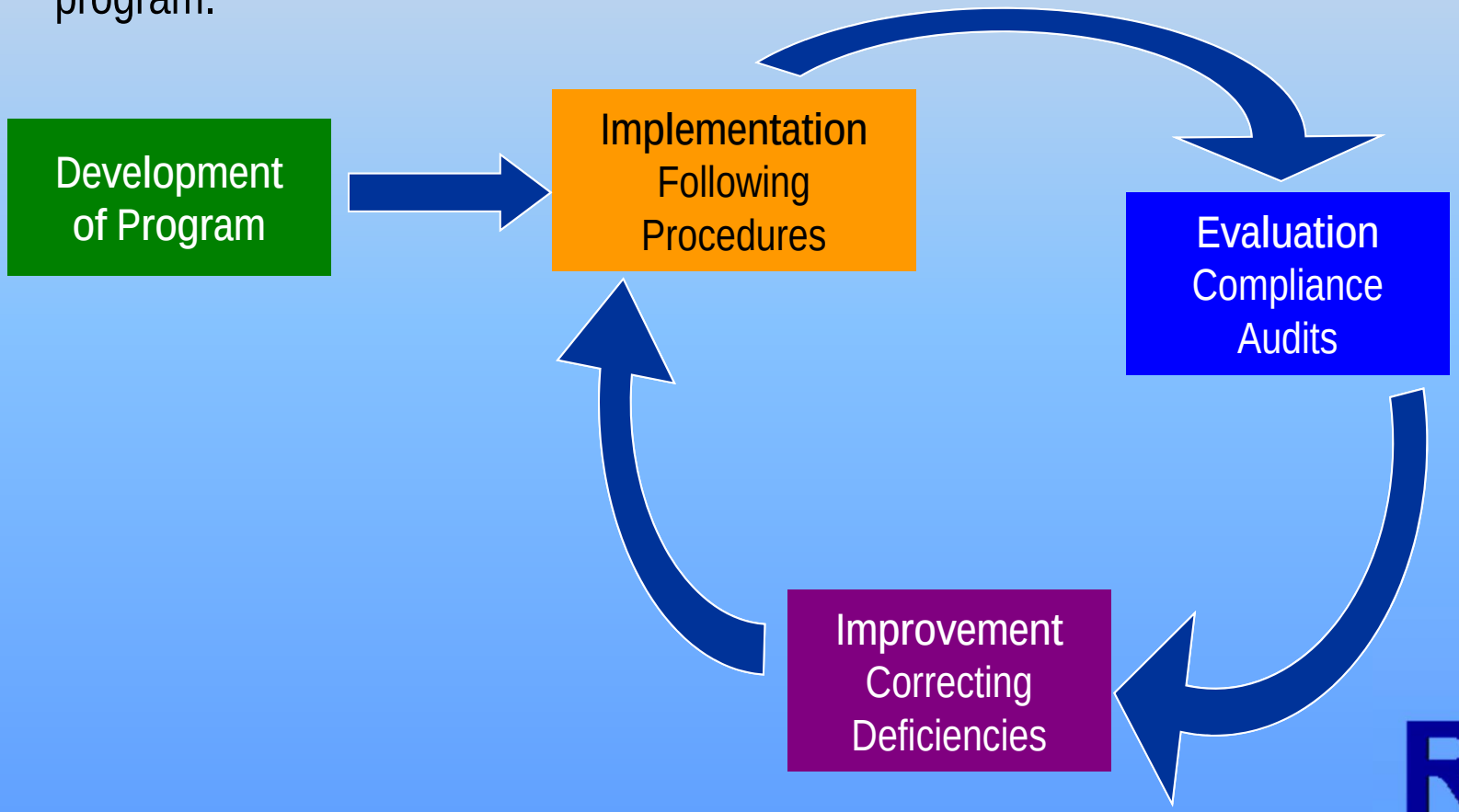
Prevention Program Life Cycle

These are “living” documents. Deficiencies will occur, procedures will change. The idea is to update and follow-up in order to demonstrate you are following your safety program.



Questions?

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