California's Proposed Process Safety Management (PSM) Regulation §5189.1 for Petroleum Refineries

Presented By
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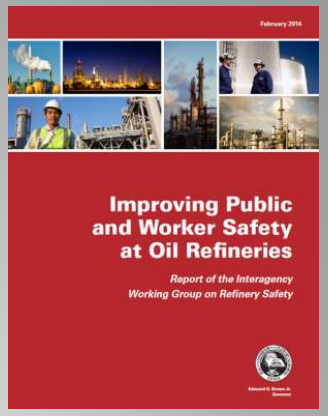
Governor's Report on Refinery Safety Recommendations:



February, 2014

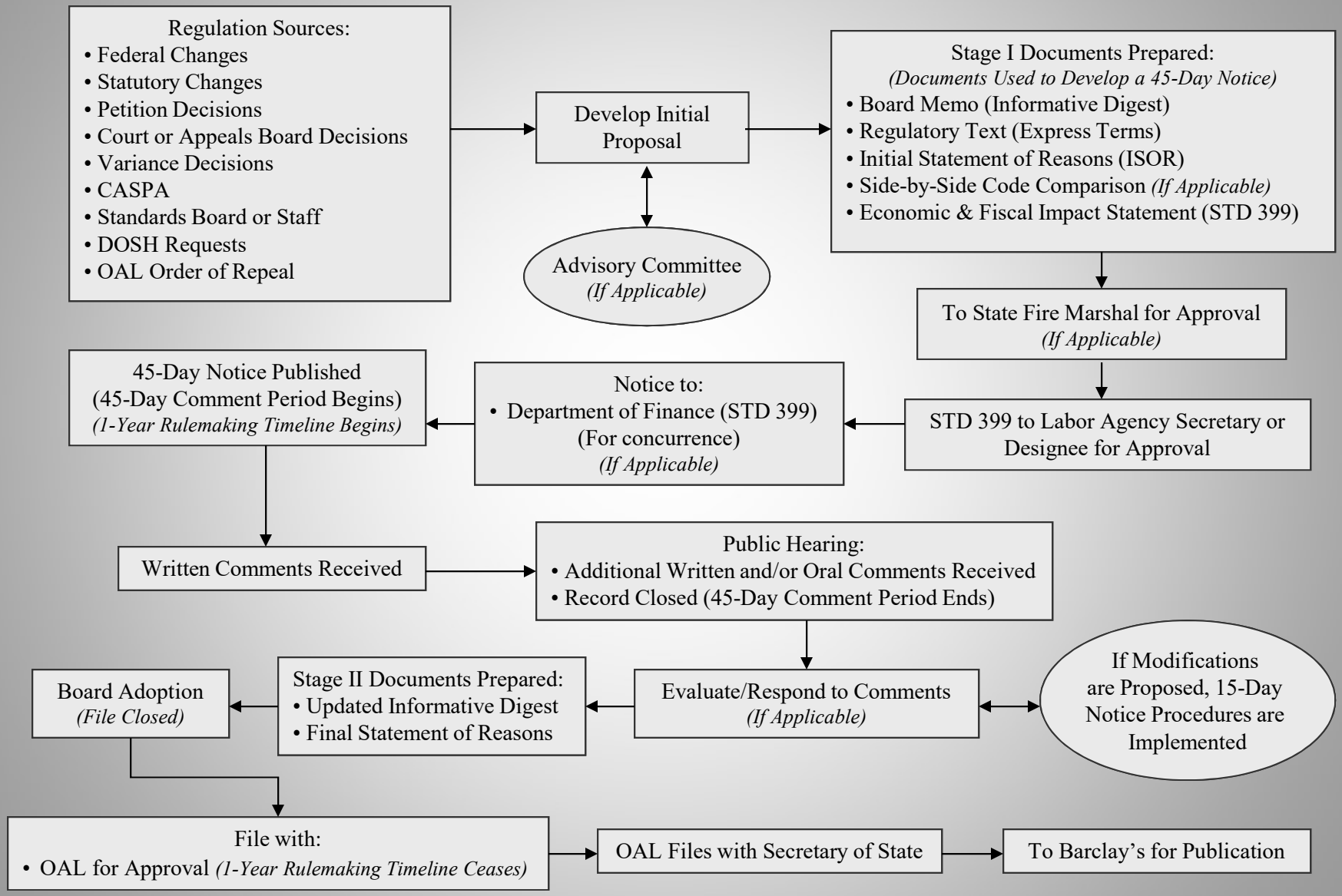
Strengthen PSM and Cal ARP Programs:

1. Implement inherently safer systems to the greatest extent feasible;
2. Perform periodic safety culture assessments;
3. Adequately incorporate damage mechanism hazard reviews into Process Hazard Analyses;
4. Complete root cause analysis after significant accidents or releases;
5. Explicitly account for human factors and organizational changes; and
6. Safeguard Protection Analysis – The use of methods such as Layer of Protection Analysis to ensure adequate safeguards.

Advisory Meetings

- September 2014
  - Oakland
- November 2014
  - Oakland
- June 2015
  - Los Angeles
- After 2015 Multiple Advisory Committee Meetings with Labor and Industry

Rulemaking Process Flowchart



Difference Between Current PSM Standard and New PSM Standard

- Current PSM Standard (5189) covers all 1940 PSM regulated facilities that are NOT petroleum refineries
- New PSM Standard (5189.1) covers petroleum refineries only

GISO Section 5189.1
Process Safety Management for Petroleum Refineries

Applicability: Petroleum Refineries

(NAICS Code 324110)

Purpose of New Regulation

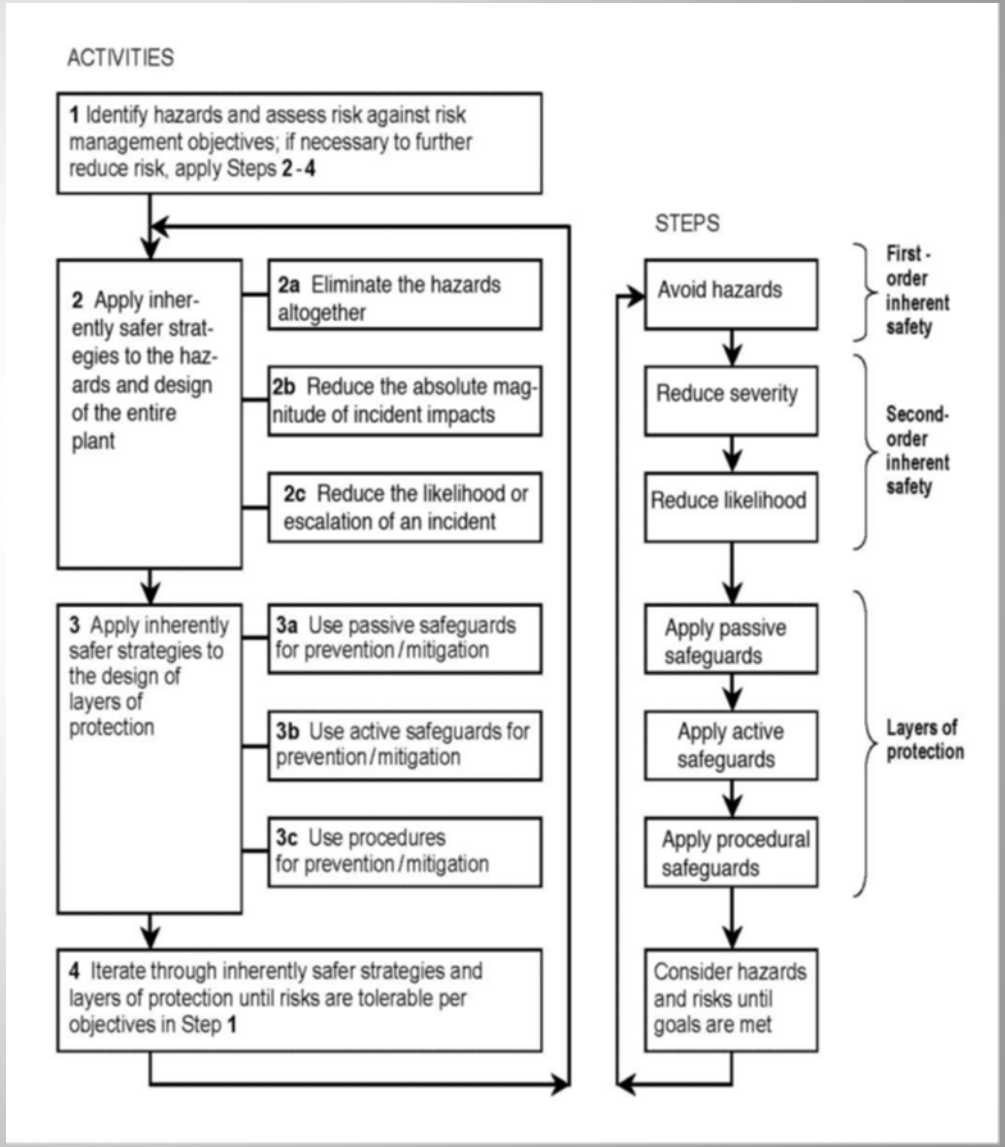
- To reduce the risk of major incidents and eliminate or minimize process safety hazards for employees.

Basic Principles of Regulation

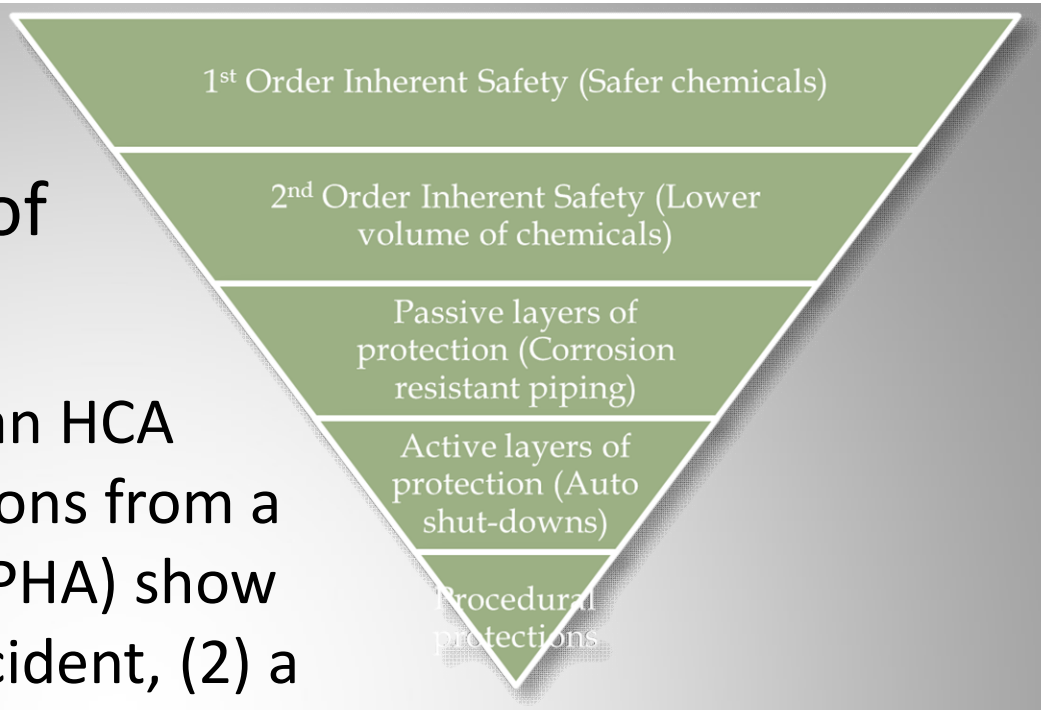
- Employer is responsible for establishing *effective* programs to comply with the regulation.
- Employee Participation is required throughout the regulation and to include contractors working in the refinery.
- Employer has ultimate decision making authority *and must document decision-making process in writing*

Hierarchy of Hazard Control

Hierarchy of Hazard Control; A system used to minimize or eliminate exposure to a hazard or to reduce the risk presented by a hazard.



Required Method when conducting a Hierarchy of Hazard Control Analysis



- Refineries must conduct an HCA when: (1) recommendations from a Process Hazard Analysis (PHA) show a potential for a major incident, (2) a major change is proposed, or (3) a major incident occurs.
- During the design of any new process, process unit, or facility.
- Refineries must select the highest order safety measure unless it is not feasible. Any finding of infeasibility must be documented.

Process Safety Culture Assessment

- What is a Process Safety Culture Assessment?
  - A Process Safety Culture Assessment is a combination of group values and behaviors that reflects whether there is a collective commitment by leaders and individuals to emphasize process safety over competing goals, in order to ensure protection of people and the environment.

Damage Mechanism Review (DMR)

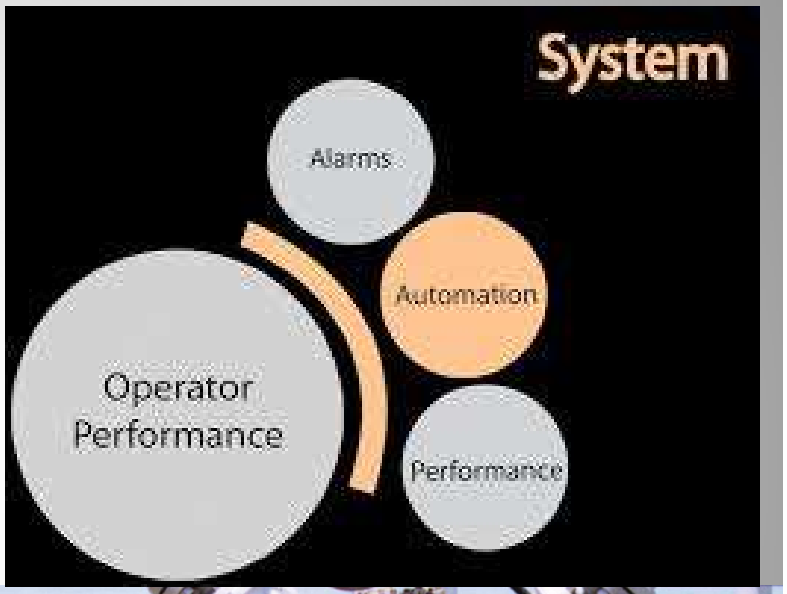
- Damage Mechanisms is a general term referring to any cause of problems or failures within process equipment, such as corrosion, stress cracking, heat damage and everything in between.

Incident Investigation/Root Cause

- Investigate incidents using effective methods that identify root causes to determine the underlying safety management system causes of the incident, which if corrected would prevent or significantly reduce the likelihood of the problem's recurrence.
- A root cause is a
  - fundamental, underlying, system-related reason why an incident occurred that identifies one or more correctable system failures.2 By conducting a root cause analysis and addressing root causes, an employer may be able to substantially or completely prevent the same or a similar incident from recurring.

Human Factors

- A discipline concerned with designing machines, operations, and work environments so that they match human capabilities, limitations, and needs. Human factors can be further referred to as environmental, organizational, and job factors, and human and individual characteristics, such as fatigue, that influence behavior at work in a way that can affect health and safety.
- Human factors program shall take into account staffing levels, complexity of tasks, time needed to complete tasks, level of training and expertise, human-machine interface, fatigue, communication systems, and other factors.

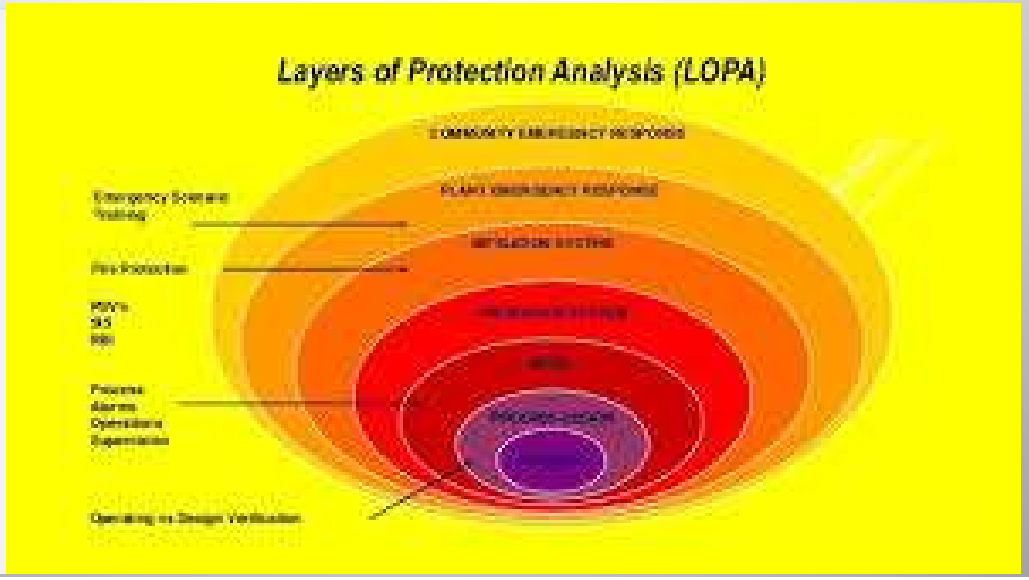


Management of Organizational Change (MOOC)

- An analysis of impacts of any staffing changes or reorganization of operations, including reducing staffing levels, changing experience levels of employees, changing shift duration, or making changes in employee responsibilities.

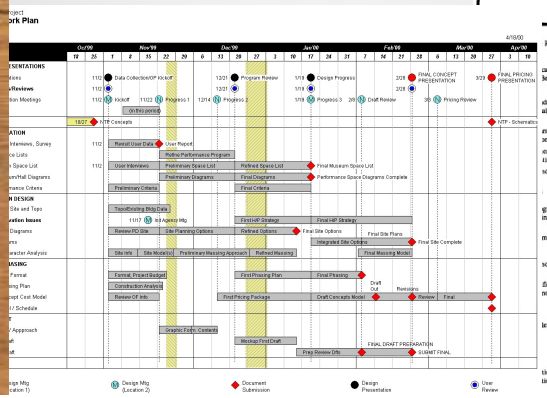
Safeguard Protection Analysis (SPA)

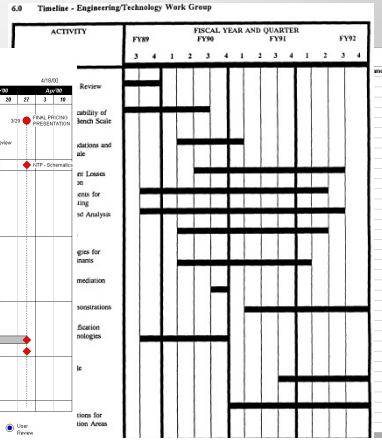
- A Safeguard Protection Analysis (SPA) provides a method for evaluating the risk of hazard scenarios and comparing it with risk tolerance criteria to decide if existing safeguards are adequate, and whether additional safeguards are needed. Various methods are utilized such as a Layers of Protection Analysis (LOPA) SPA's can be viewed as an extension of Process Hazard Analysis (PHA).

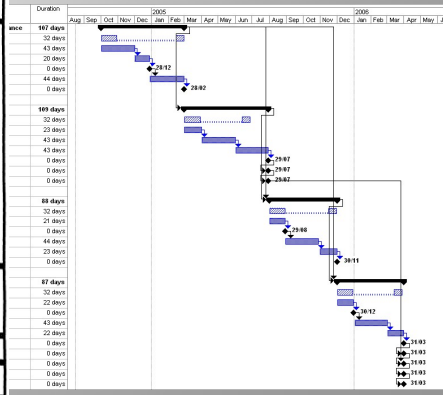


PSM Program

- The PSM program is a written management system to ensure that all program elements are developed, implemented, modified when needed, communicated, and roles and responsibilities are assigned.
- The employer shall designate the refinery manager as the person with authority and responsibility for compliance with this section.







QUESTIONS?