



Process Safety Management 101

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Process Safety Moment

- Standard Operating Procedures
 - Do operators read your procedures? Take a look at them and notice how long they are. Are they too long and cumbersome? Maybe it is time to review and revise them to a much more manageable length. Keep the extra information for a policy and keep your procedures to the point. It will help everyone involved!

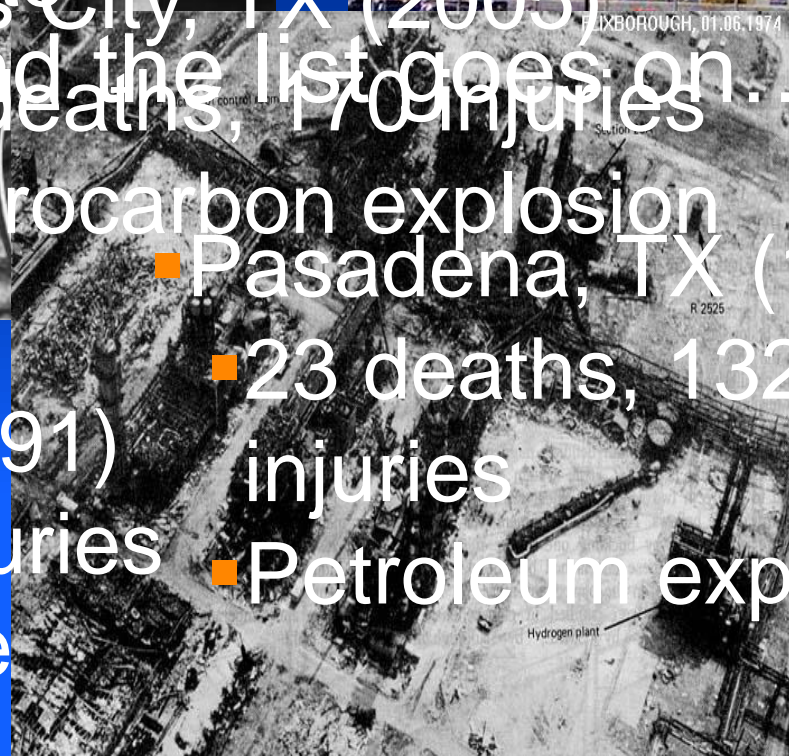


Agenda

- Why do we have PSM?
- When was PSM started?
- What is PSM?
- Who does PSM apply to?
- How do we apply PSM?

Why do we have PSM?

- Lemont, IL (1984)
- Bhopal, India (1984)
 - 3,000 deaths and explosion
- Methyl Isocyanate release
 - Texas City, TX (2005)
 - And the list goes on...
 - 15 deaths, 170 injuries
 - Hydrocarbon explosion
 - Pasadena, TX (1989)
 - 23 deaths, 132 injuries
- Sterlington, LA (1991)
 - 8 deaths, 128 injuries
 - Chemical release
 - Petroleum explosion





Bhopal, India





Phillips 66 - Pasadena



BP – Texas City





OSHA PSM Standard 1910.119

- OSHA Proposed rule in 1990
- Amid pressure from the general public and Congress for regulations
- OSHA produced the PSM standard in 1992
- 5 year implementation
 - Enforcement in 1997



What is PSM?

- Process Safety Management
 - The application of management controls in a way that process hazards are identified, understood, and controlled so that process-related injuries and incidents can be eliminated
 - Elements include:
 - Technology
 - Facilities
 - Personnel

14 Elements of PSM





What are the benefits of PSM?

- ✓ Longevity for plants and process equipment
- ✓ Better equipment reliability
- ✓ Reduced incident risk
- ✓ Save money in the long run
- ✓ “We all want to go home in a safe and healthy condition, the same condition as when we arrived at work.”
- ✓ Safe, healthy and happy work environment, free of accidents

What Processes are Covered?

- A process which involves a flammable liquid (FP < 100 °F) or flammable gas (as defined in 1910.1200(c)) on-site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more





What Chemicals are Covered

- A list of Chemicals in Appendix A of the rule
- There are 130 highly hazardous chemicals (HHC's) that are covered and contain a Threshold Quantity
 - Ozone – 100 lbs
 - Methyl Mercaptan – 5,000 lbs
 - Methyl Chloride – 15,000 lbs



What Industries are Covered?

- Industries that process chemicals such as:
 - Industrial Organics & Inorganics
 - Paints
 - Pharmaceuticals
 - Adhesives
 - Sealants and Fibers
 - Petrochemical facilities
 - Paper Mills
 - Food Processing with Anhydrous Ammonia over the TQ



Exemptions

- Fuels used for workplace consumption
- Comfort heating
- Gasoline for vehicles
- Flammable Liquids stored in atmospheric tanks or transferred which are kept below their boiling point without the benefit of chilling or refrigeration
- Does not apply to retail, oil and gas drilling, or servicing and unoccupied remote facilities





PSM in a nutshell

- Developed to eliminate industrial accidents involving Highly Hazardous Chemicals
- 14 Elements that tie together to form a comprehensive program guideline
- Designed to protect personnel, plant, profits, planet

How do we apply PSM?





What are you talking about?

- ALARP
 - As Low as Reasonably Possible
- CFR
 - Code of Federal Regulations
- CSB
 - Chemical Safety Board
- DCS
 - Distributed Control System
- ESD
 - Emergency Shut Down
- FEED
 - Front End Engineering Design



What are you talking about?

- FMEA
 - Failure Modes Evaluation Analysis
- HAZCOM
 - Hazard Communications
- HAZOP
 - Hazard and Operability Review
- IPL
 - Independent Protection Layer
- LOPA
 - Layer of Protection Analysis
- MI
 - Mechanical Integrity



What are you talking about?

- P&ID
 - Piping and Instrumentation Diagram
- PFD
 - Process Flow Diagram
- MOC
 - Management of Change
- NFPA
 - National Fire Protection Association
- PHA
 - Process Hazard Analysis
- PM
 - Preventative Maintenance



What are you talking about?

- PSSR
 - Pre-Start up Safety Review
- RMP
 - Risk Management Plan
- SIS
 - Safety Instrumented System
- RAGAGEP
 - Recognized and generally accepted good engineering practices



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- K and K Process uses its decades of experience in industry to help process companies complement existing PSM staff. We apply our knowledge of management systems and encourage creativity and problem solving to provide real world solutions, not theoretical assumptions for your site. We utilize a balanced approach to the PSM process, realizing that all aspects of PSM tie together for Corporate, Site, PSM, and OSHA compliance.
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