



Agri-Energy's Process Safety Management Program

Purpose of the PSM Standard

- *Created in 1990 by OSHA*
- *Resulted from series of accidents that occurred at chemical processing facilities*
- *Designed to prevent the release of flammable and toxic chemicals*

PSM and RMP

- PSM
 - OSHA – Protect employees
- RMP (Risk Management Plan)
 - EPA – Protect the public
- Very similar to each other
- Training covers both areas

Program Administration

- Administration
 - Operations Manager
 - Operations aspects: procedures, startup, shutdown, training
 - Overall: audits, management of change, investigations
 - Maintenance Manager
 - Maintenance: Inspections, replace in kind, training
- Copies
 - Kept in operations and maintenance office as well as the control room

Agri-Energy's Covered Processes

- Distillation
 - Flammable alcohol
 - From rectifier on
 - Alcohol flammable over 23% - NFPA 3
- Tank Farm
 - Alcohol and denaturant – All flammable
 - Denaturant – NFPA 4
 - All tanks
- Ammonia
 - Not Covered in Agri-Energy but would be if there was more on site

What is part of the PSM program?

- Process Safety Information
- Process Hazard Analysis
- Operating Procedures
- Contractors
- Start Up
- Mechanical Integrity
- Hot Work Permit
- Management of Change
- Incident Investigation
- Emergency Preparedness

Process Safety Information

- SDS Sheet
 - Flammability
 - Toxicity
 - Emergency Response
 - PPE
 - PIDs
 - Piping Specifications
 - Control loops
 - Check valves
- DCS system
- Screen Shots
 - Alarm settings
 - Control parameters.
 - Interlocks

Process Hazard Analysis

- Identify possible points where accidents can occur
 - Human error
 - Previous accidents
 - Consequences of failures
 - Examination likely accidents
- Addresses points and plan of actions
- Involves input from all parts of the plant
 - Operations
 - Maintenance
 - Management
 - Shift workers
 - Engineering

Operating Procedures

- DCS Parameters
 - When to adjust set points to what values
 - What steps to take when values are out of parameter
 - Interlocks
- Start up and shutdown procedures
- Operations
 - When motors are started
 - When valves are open and closed
- Not following procedures could cause accidents
 - Starting a pump with a closed valve can cause problem

Training

- Hot work
- LO/TO
- Confined space
- RTK/MSDS
- Emergency Response
- On the job, hands on training

Contractors

- Select safe contractors
 - Accident history
 - Safety procedures
 - Knowledge and attitude
- Communication with contractors
 - Safety hazards
 - Safety policies
 - Emergency response

Start Up

- Occurs when starting up a new plant or a new process
 - Perform PHAs
 - Review of engineering information
 - Safety, operating, and maintenance procedures
 - Training

Mechanical Integrity

- Inspection and testing
 - Vessels need to be inspected to prevent accidents
 - Relief valves need be checked to insure correct operation
 - Record keeping of all maintenance work done on covered processes

Mechanical Integrity

- Inspection and testing
 - Vessels need to be inspected to prevent accidents
 - Relief valves need be checked to insure correct operation
 - Record keeping of all maintenance work done on covered processes
- Replace in kind
 - If a part is replaced with a different one, it could cause an accident
 - Gasket may not be compatible with alcohol, ammonia, or steam
 - Make sure that new equipment doesn't change safe operation like a new pump over pressurizing
 - Can be overseen by computer maintenance program

Hot Work Permit

- Hot Work permit
 - Ethanol fires most common cause of accidents during maintenance
 - Ensure prevention of alcohol being exposed to a flame
 - Make sure lines are empty before opening.

Management of Change

- Changes that invoke review
 - Temporary changes
 - Changes outside current procedures
 - New setpoint outside of normal safe range
 - Changes in equipment
 - Different gaskets, relief valves
- If a change occurs steps need to be taken
 - Approval by management
 - Possible PHAs
 - Reviews
 - Documentation
- Ensure change doesn't cause accident

Incident Investigation

- Investigation by team
 - People who can best evaluate incident
- Report
 - Date
 - Description
 - Cause
 - Corrective action

Emergency Preparedness

- Covered under Emergency Response training
- What to do in case of accident

Audits

- Every three years
- Looks for holes in program
 - PSI Information
 - Inspection
 - Feedback from employees

Employees

- Involvement
 - Need to know what is safe
 - Work with process every day
 - Input on ideas and concerns
 - All information is available
- Operations and Maintenance
 - Control the details of the plant
 - See the day to day running of the plant
 - Safety frontline

Management

- To ensure all maintenance and operations procedures are safe
 - Review operating procedures and determines safe setpoints
 - Review maintenance logs and routine maintenance
- To provide all necessary safety information
 - MSDS sheets
 - PSM Plan
- To ensure that all PSM regulation are followed

In Summary

- PSM creates a management system that prevents the release of toxic and hazardous chemicals
- This is done via operations and maintenance procedures setup by management
- Details are important, one mistake can cause an accident