



گروه تخصصی مهندسی ایمنی و HSE دانا پایش

اهواز-شهرک صنعتی ۴، برج فناوری، طبقه دوم، واحد ۳۰۸

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نام دوره:

سیستم مدیریت ایمنی فرآیند (PSM)



مدرس: مهندس فرهاد حسین زاده

گروه تخصصی مهندسی ایمنی و HSE دانا پایش

معرفی دانا پایش :

• گروه دانا پایش با مجوز از سازمان صنعت ، معدن و تجارت فعالیت خود را در سال ۱۳۹۶ با مشاوره در حیطه های تخصصی HSE و برگزاری دوره های آموزشی در حوزه سیستم های مدیریت HSE بصورت تخصصی آغاز نمود. با توجه به نیاز استان به وجود یک مرکز مشاوره و آموزش کاملاً تخصصی و خلاق در زمینه مدیریت HSE مجموعه دانا پایش راه اندازی شد. با عنایت به رشد استانداردهای جهانی و لزوم پیشگیری از حوادث قبل از وقوع، نیاز به آموزش ، ارتقاء فرهنگ و استقرار سیستم مدیریت HSE در تمام صنایع، شرکتها و سازمانها احساس می شود. لذا هدف از تاسیس این مجموعه ارتقاء تفکر ایمن، جامعه ایمن و سرمایه ایمن در تمام سازمان ها و شرکتها و صنایع می باشد.

گروه تخصصی مهندسی ایمنی و HSE دانا پایش

معرفی دانا پایش :

• اعضاء دانا پایش از سال ۱۳۹۲ با فعالیت در پروژه های متعدد در زمینه های HSE در شرکت های متعدد و بزرگ نفتی توانستند دانش و تخصص لازم را در حوزه های مهندسی ایمنی ، ایمنی فرآیند، مدیریت بحران و HSE را کسب نمایند. همچنین با توجه به نیاز کارفرمایان به یک مجموعه کامل و ارائه دهنده خدمات تخصصی در سه زمینه مهندسی ایمنی ، مهندسی بهداشت حرفه ای و مهندسی محیط زیست این مجموعه در زمینه های پیاده سازی سیستم های مدیریت HSE ISO- ، اندازه گیری عوامل زیان آور محیط کار و محیط زیست را با توجه به نیاز استان و جهت ارائه خدمات به کارفرمایان بزرگ در استان خوزستان به خدمات تخصصی خود اضافه کرد.

گروه تخصصی مهندسی ایمنی و HSE دانا پایش

معرفی دانا پایش :

• دانا پایش متشکل از چهار دپارتمان اصلی در زمینه ارائه خدمات تخصصی HSE می باشد:

1 دپارتمان مهندسی ایمنی و ایمنی فرآیند

2 دپارتمان اندازه گیری عوامل زیان آور و محیط زیست

3 دپارتمان سیستم های مدیریت HSE-ISO

4 دپارتمان آموزش های تخصصی HSE

• لذا مجموعه دانا پایش با همراهی دپارتمان های تخصصی خود در نظر دارد جهت مرتفع ساختن مشکلات صنعتی کشور بویژه مجتمع ها و شرکت های حاضر در استان خوزستان و با اتکا به پتانسیل و اعضاء با تجربه و متخصص شرکت آمادگی خود را جهت انجام پروژه های مرتبط با مهندسی ایمنی و HSE به کارفرمایان بزرگ اعلام می دارد.

گروه تخصصی مهندسی ایمنی و HSE دانا پایش

Introduction

Unexpected releases of toxic, reactive, or flammable liquids and gases in processes involving highly hazardous chemicals have been reported for many years. Incidents continue to occur in various industries that use highly hazardous chemicals which may be toxic, reactive, flammable, or explosive, or may exhibit a combination of these properties.



Statistics

1984

- Bhopal, India ,2000 DEATHS

1988

- Piper Alpha 167 Deaths

1974

- Flixborough, 28 Deaths

Analysis Of Bhopal



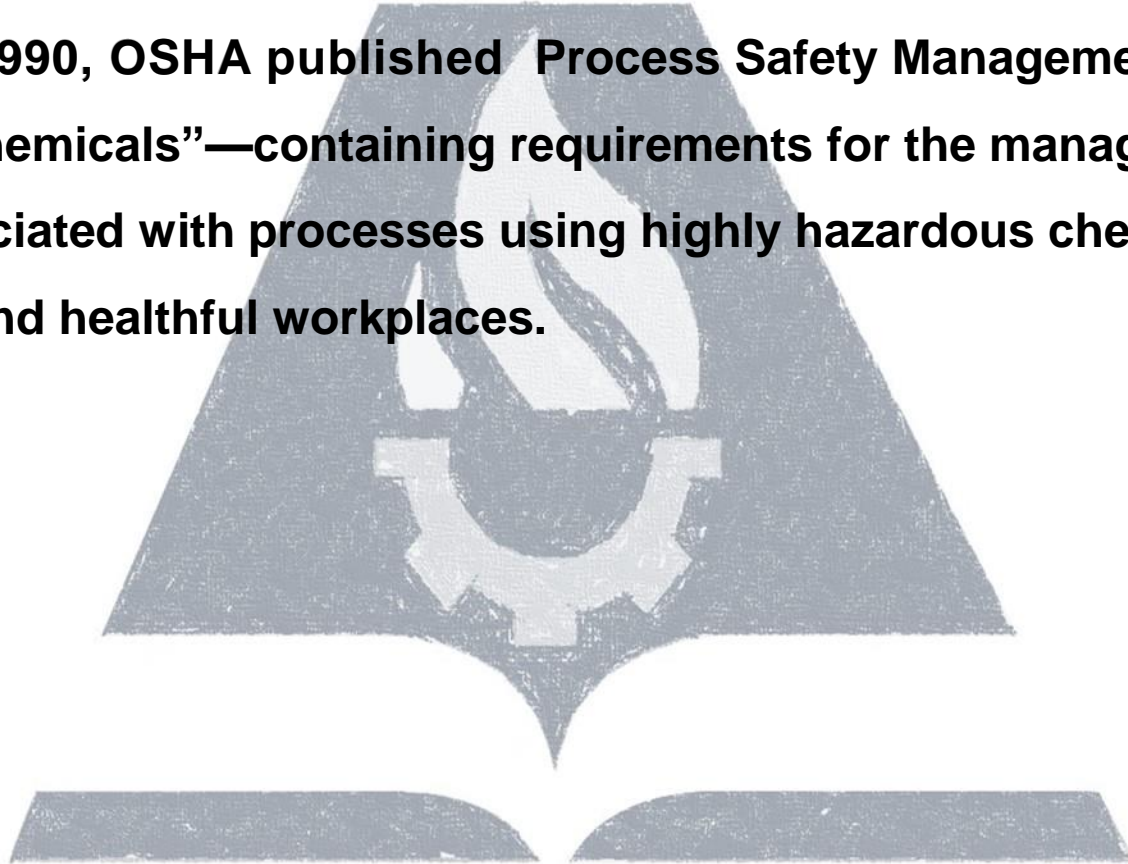
Analysis Of Flixborough





History

On July 17, 1990, OSHA published “Process Safety Management of Highly Hazardous Chemicals”—containing requirements for the management of hazards associated with processes using highly hazardous chemicals to help assure safe and healthful workplaces.



Application Of PSM

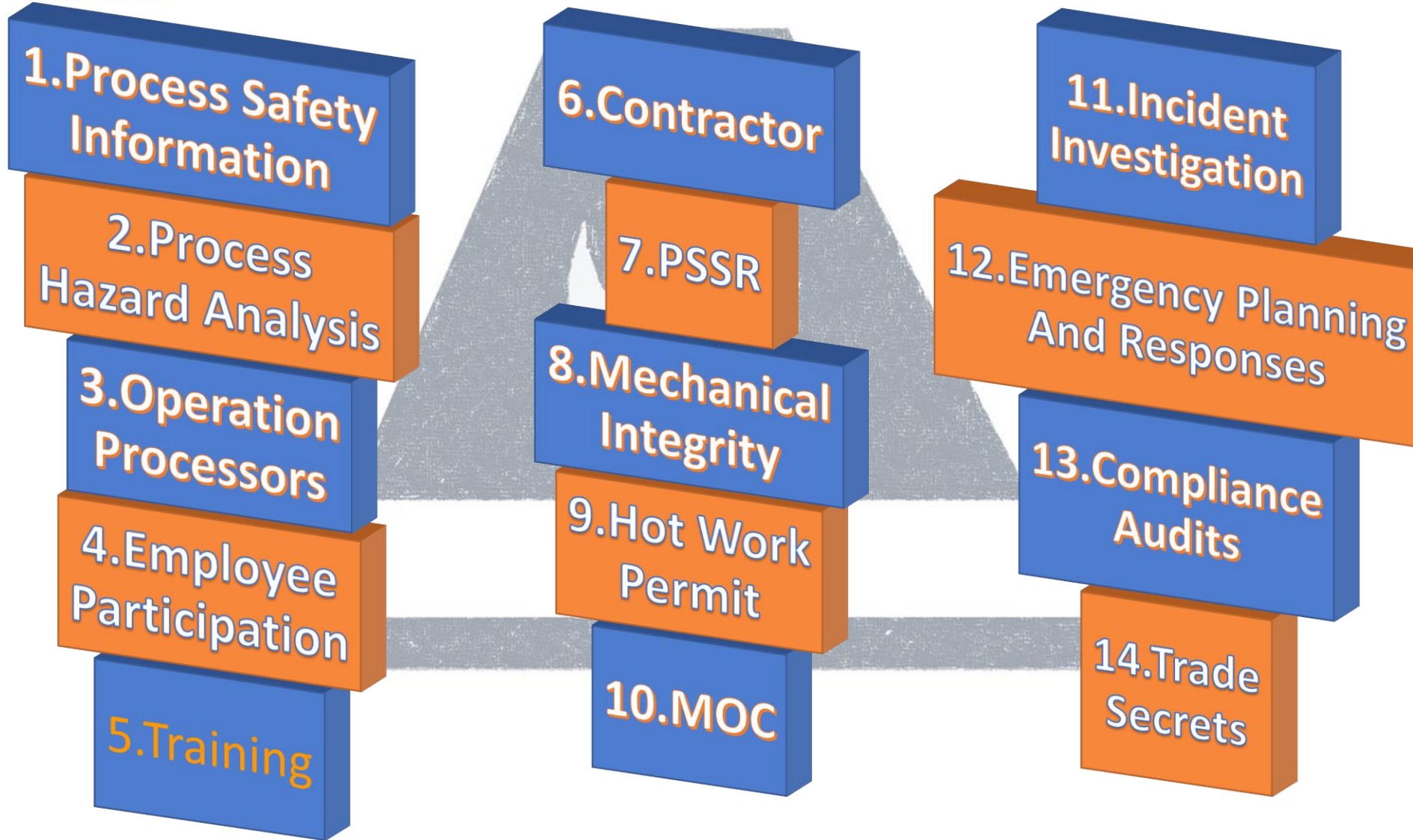
**flammable liquids and gases
in quantities of 10,000
pounds**

**130 specific toxic and
reactive chemicals in listed
quantities**

PHA

PROCESS

PSM ELEMENTS



1-Process Safety Information

✓ Information on the hazards of the highly hazardous chemicals

- Toxicity
- Permissible exposure limits
- Physical data
- Reactivity data
- Corrosively data
- Thermal and chemical stability data, and hazardous effects of inadvertent mixing of different materials.





1-Process Safety Information

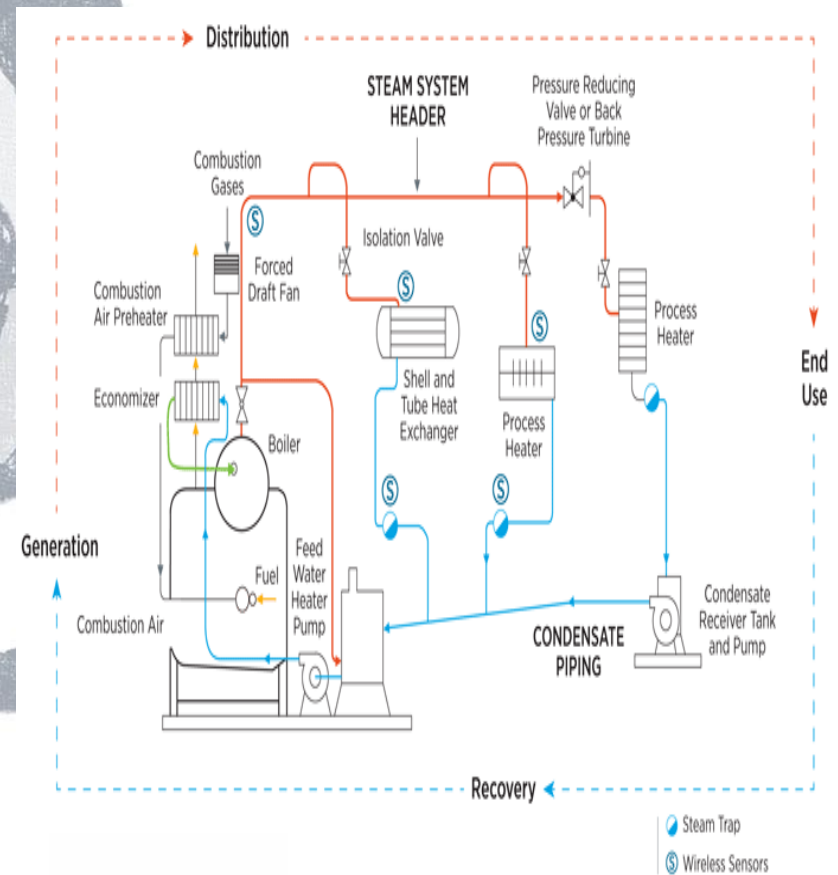
✓ Information on the technology of the process

- 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, including those affecting the safety and health of employees.

1-Process Safety Information

✓ Information on the equipment in the process

- 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 for processes

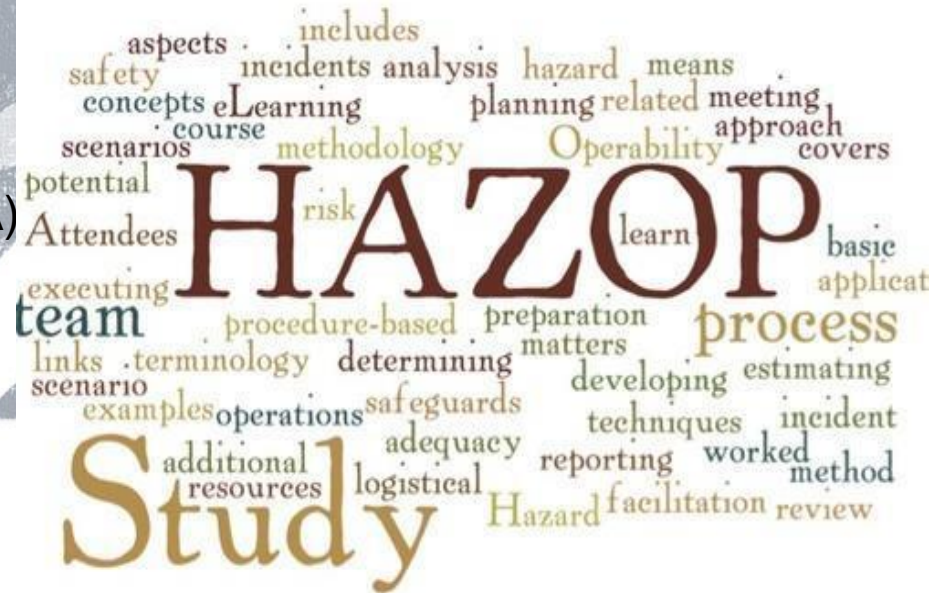


2-Process Hazard Analysis

The process hazard analysis is a thorough, orderly, systematic approach for identifying, evaluating, and controlling the hazards of processes involving highly hazardous chemicals.

Determine and evaluate the hazards of the process:

- What-if,
- Checklist,
- What-if/checklist,
- Hazard and operability study (HAZOP),
- Failure mode and effects analysis (FMEA)
- Fault tree analysis, or
- An appropriate equivalent methodology



2-Process Hazard Analysis

✓ Whichever method(s) are used, the process hazard analysis must address the following:

- The hazards of the process;
- The identification of any previous incident
- Engineering and administrative controls
- Consequences of failure of engineering
- Facility siting
- Human factors
- A qualitative evaluation



3. Operating Procedures

The employer must develop and implement written operating procedures, consistent with the process safety information, that provide clear instructions for safely conducting activities involved in each covered process.

✓ **Steps for each operating phase:**

- **Initial startup**
- **Normal operations**
- **Temporary operations**
- **Emergency shutdown**
- **Emergency operations**
- **Normal shutdown**
- **Startup following a turnaround**



3. Operating Procedures

✓ **Operating limits:**

- Consequences of deviation, and
- Steps required to correct or avoid deviation.

✓ **Safety and health considerations**

✓ **Chemicals Hazards**

- **Engineering controls, administrative controls, and personal protective equipment**
- **Control measures to physical contact airborne exposure occurs airborne exposure occurs**
- **Quality control, hazardous chemical**
- **Any special or unique hazards**
- **Safety systems**

4. Employee Participation

- ✓ Employers must develop a written plan of action to implement the employee participation required by PSM
- ✓ Consult with employees on the process hazard analyses
- ✓ Must provide to employees access to process hazard analyses

Employee Participation



5. Training

- ✓ Initial Training
- ✓ Refresher Training
- ✓ Training Documentation

6. Contractors

PSM applies to contractors performing maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to a covered process.



6. Contractors

✓ Employer Responsibilities

Evaluate information regarding the contract employer's safety performance and programs

Potential Hazard

Emergency action plan

Control the presence, entrance and exit

Injury and illness log related



6. Contractors

✓ Contract Employer Responsibilities

Ensure that contract employees are trained in the work practices necessary to perform their job safely

Ensure that contract employees are instructed in the known potential fire, explosion, or toxic release hazards related to their job and the process, and in the applicable provisions of the emergency action plan;



6. Contractors

✓ Contract Employer Responsibilities

Document that each contract employee has received and understood the training required by the standard by preparing a record that contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training;

Ensure that each contract employee follows the safety rules of the facility including the required safe work practices required in the operating procedures section of the standard; and

Advise the employer of any unique hazards presented by the contract employer's work.

7. Pre-Startup Safety Review

Before any highly hazardous chemical is introduced into a process

New facilities and modified facilities



7. Pre-Startup Safety Review

**PSSR must confirm
that the following:**

Construction and equipment are in accordance with design specifications

Safety, operating, maintenance, and emergency procedures

Process hazard analysis

Training of each employee involved in operating

8. Mechanical Integrity

OSHA believes it is important to maintain the mechanical integrity of critical process equipment to ensure it is designed and installed correctly and operates properly.



8. Mechanical Integrity



Pressure vessels and storage tanks

Piping systems

Relief and vent systems and devices

Emergency shutdown systems

Controls

Pumps

8. Mechanical Integrity

The employer must establish and implement written procedures to maintain the ongoing integrity of process equipment.

Employees involved in maintaining, train, process, hazards, procedures

Inspection and testing process equipment

Equipment deficiencies outside the acceptable limits defined by the process safety information must be corrected before further use.

8. Mechanical Integrity

**Constructing new
plants and
equipment**

**Employer also
must ensure that
maintenance
materials, spare
parts, and
equipment**

9. Hot Work Permit

A permit must be issued for hot work operations conducted on or near a covered process.



10. Management of Change

OSHA believes that contemplated changes to a process must be thoroughly evaluated to fully assess their impact on employee safety and health and to determine needed changes to operating procedures.



10. Management of Change

Procedures must ensure that the following considerations:

The technical basis for the proposed change

Impact of the change on employee safety and health

Modifications to operating procedures

Necessary time period for the change

Authorization requirements for the proposed change

11. Incident Investigation

A crucial part of the process safety management program is a thorough investigation of incidents to identify the chain of events and causes so that corrective measures can be developed and implemented

Accordingly, PSM requires the investigation of each incident that resulted in, or could reasonably have resulted in, a catastrophic release of a highly hazardous chemical in the workplace.

11. Incident Investigation

Date of incident

Date investigation began

Description of the incident

Factors that contributed to the incident

Recommendations resulting from the investigation

12. Emergency Planning and Response

If, despite the best planning, an incident occurs, it is essential that emergency pre-planning and training make employees aware of, and able to execute, proper actions.



**EMERGENCY
PLAN**



Emergency Plan
an escape R... drawing a floor
residence.
ocation 01
e furniture
sur

13. Compliance Audits

Least every
three years

Adequate
procedures

one person
knowledgeable
in the process

Report of the
findings
deficiencies

14. Trade Secrets

Process hazard analysis

Operating procedures

Incident investigations

Emergency planning and response

Compliance audits



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