

# Implementation of Process Safety Management at GPIC

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Jan 1999 – Dec 2001
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# Introduction to GPIC

- Established in December 1979
- Joint-Venture between the Government of Bahrain , (SABIC) Saudi Arabia & (PIC) Kuwait
- Utilizes Natural Gas as raw material
- Started production in 1985 in Kingdom of Bahrain
- Produces Ammonia , Methanol (1200 MTPD each) and Urea (1700 MTPD)

# GPIC's Management Systems

- ISO 9001 "Quality Management System"- year 1995
- ISO 14001 "Environment Management system"-year 1999
- OSHA 1910.119 Process Safety Management- year 1999
- OHSAS 18001 "Occupational Health & Safety"- year 2004
- PAS 99 Integration of Management systems - year 2006
- ISO 27001 "Information Security Management System"-year 2006
- COSO "Enterprise Risk Management System" year 2008
- RC 14001 "Responsible Care Management System"- year 2010

# What is Process Safety Management (PSM)?

It is management of process hazards to prevent the occurrence of, or minimize the consequence of catastrophic releases of toxic or explosive materials during design, construction, start-up, operation, inspection, maintenance and modification of facilities

# Safety Management (PSM) Elements: OSHA (29 CFR 1910.119)

- 1- Employee Participation
- 2- Process Safety Information
- 3- Process Hazard Analysis
- 4- Operating Procedures
- 5- Training
- 6- Contractors
- 7- Pre-Startup Safety Review
- 8- Mechanical Integrity
- 9- Hot Work Permit
- 10- Management of Change
- 11- Incident Investigation
- 12- Emergency Planning
- 13- Compliance Audits
- 14- Trade Secrets

# Phase 1: Plan of PSM implementation

## Year 1999- 2001

- Directed by GPIC Management to implement "PSM"
- PSM Implementation Team formed:
  - Team leader : Technical Services Manager
  - Safety and Security Manager
  - Safety and Security Superintendent
  - Ammonia plant Superintendent
  - Chief Engineer
  - Senior Project engineer
  - Quality and environment facilitator

# Phase 1: Plan of PSM implementation

- Team recommended adoption of OSHA 1910.119
- Strategy of 3 years determined to implement at a rate of completing four PSM elements per year.
- Team reviewed GPIC systems against the OSHA standard
- Developed Main PSM Procedure
- GPIC's operation management systems formed good basis for further enhancement in line with the OSHA Standard.



# Phase 1: Plan of PSM implementation

## ■ Groups of implementation of PSM elements:

### Group 1

- Process Safety Information
- Process Hazards Analysis
- Management of Change

### Group 2

- Contractors Safety Management
- Preparation for Emergency
- Mechanical Integrity
- Operating Procedures

# Phase 1: Plan of PSM implementation

## Group 3

- Pre-start up Safety Review
- Accident & Incident Investigation
- Training
- Hot work permits
- Compliance Audits

# Phase 1: Plan of PSM implementation

Reputed USA based consulting firm was contracted for :

- Conducting and producing a gap analysis report on GPIC PSM system in year 2002
- Training of PSM element to management , element administrators and employees
- Provide guidance on addressing the GAP
- The actions were completed satisfactoriy

# Post Phase 1 Status

1. Revised procedures to close the Gaps
2. PSM was integrated in GPIC management systems and implemented
3. PSM system remained mostly in the same status since 2004
4. Internal audits revealed some Major and Minor non-conformities
5. A benchmark study in 2007 revealed that GPIC PSM system requires further enhancement

## Phase 2: Enhancement of PSM system

- Management directive issued to further Enhance PSM system in year 2008
- PSM enhancement team formed
- Assessment consultant contracted to re-assess GPIC PSM system.

# Phase 2: Enhancement of PSM system

## Assessment objectives by external consultant:

1. Assess GPIC Documentation of Management Systems
2. Conduct assessment of field compliance
3. Train GPIC future PSM compliance auditors
4. Identify future GPIC training needs
5. PSM elements Improvement areas

# Lessons Learned

1. Organizational structure , leadership ,and accountabilities
  - Appointment of management sponsor and PSM element administrator and sub - administrator
    - Creation of a Process Safety Management Committee to periodically oversee PSM implementation
    - Senior management awareness, involvement, and commitment is essential

# Lessons Learned

2. Develop a PSM controlling document that addresses each element with :
  - Scope and objectives
  - Responsibilities and accountabilities
  - Requirements of the standard
  - Cross referencing to management systems documents
  - Key performance indicators



# Lessons Learned

3. Auditing:
  - Include auditing of PSM in scope of internal audits
  - Conduct the compliance audit min every 3 years
  - Element administrators can follow up implementation and closing of the audit finding
4. Use key performance indicators to measure the ongoing health of each PSM element

# Lessons Learned

5. Provide Training and Awareness to :
  - Executive management to ensure commitment
  - Element administrators and Employees to ensure efficient implementation
  - Types of required training :
    - a) Initial training before implementation stage
    - b) Refresher training on major elements
    - c) Procedures and Documents
    - d) Hazops and Hazard identification
    - e) Internal auditors on PSM auditing and/or compliance audits

# Lessons Learned

6. Integrate PSM relevant documents in the company's management and SHE system
7. Contact neighboring industries to benefit from their experience
8. The company should use the implementation strategy which fits its culture , resources, and capabilities

# Lessons Learned

- 9 Follow the same principles of the ISO standards of continually improve the effectiveness of the implementation through the objectives, audits, performance assessment, & management reviews

Thank you