Building Process Safety Competency

5th CCPS Global Summit on Process Safety

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High Level of Process Safety Management is Crucial to Prevent Major Hazards

- Major process safety incidents rarely happen, however if they do the results are catastrophic

- Companies involved in such incidents normally suffer:
    - Loss of Reputation
    - Financial Loss
    - Legal Suits
    - Loss of business opportunities

- Maintaining a high standard of Process safety is a License to Operate

- It is our role as leaders to make sure that adequate process safety standards are established in our company or the site in which we operate.

High Level of Process Safety Management is Crucial to Prevent Major Hazards

Reports on major process safety incidents citing competency of personnel as one of the top 10 human factor issues contributing to major incidents.

- West Fertilizer Explosion and Fire
  - Material exploded
  - Poor hazard awareness
  - 15 fatalities, >160 injured

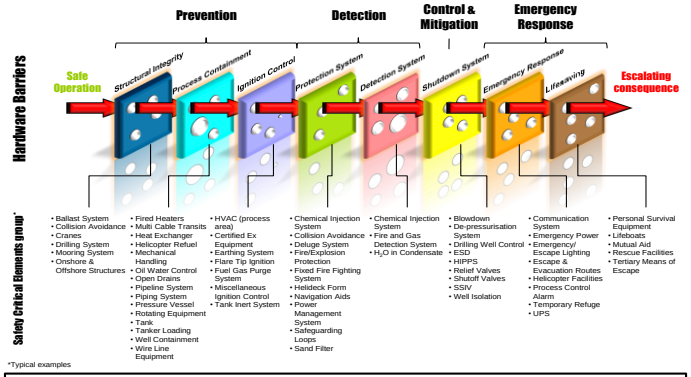
- Chevron Refinery Fire
  - Pipe ruptured release of flammable gas
  - Poor understanding of damage mechanism
  - 15,000 residents sought medical treatment

- T2 Laboratories explosion and fire in Florida
  - Reactive chemical explosion
  - Lack of knowledge on reaction and hazards
  - 4 Fatalities

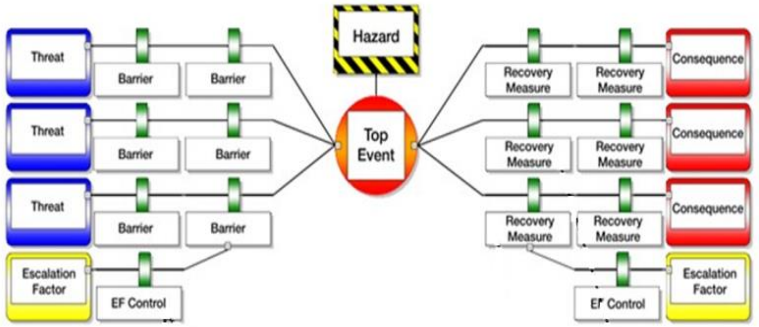
- Texas Refinery explosion
  - Explosion after liquid release from flare
  - Insufficient skilled staff during start-up
  - 16 Fatalities

Ensuring Relevant Barriers are Identified, Installed, Maintained and Practices that help to Reduce the Risk

Major Incidents Findings Indicate Multiple Failures of Process Safety Barriers



Barriers (Safety Critical Elements)



HEMP: Bow-Tie

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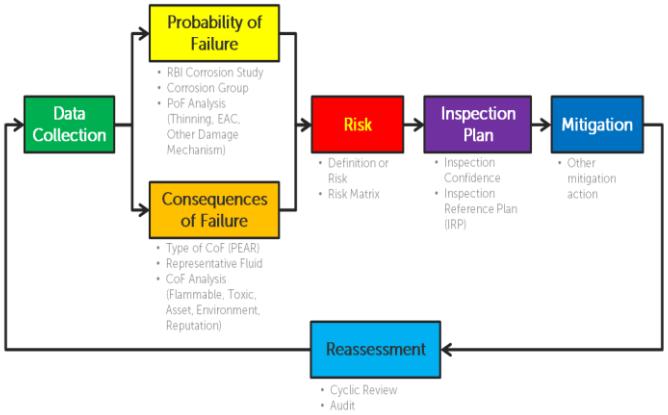
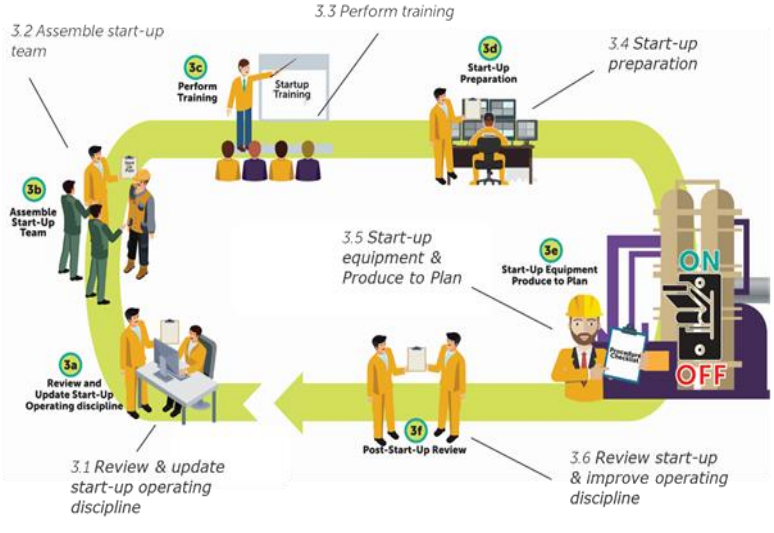
Structured System and Work Processes Need to be Established to Manage Change

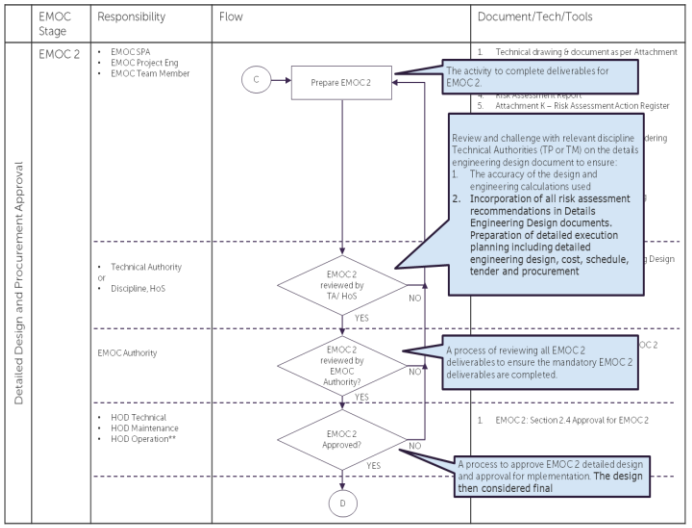
- **Potential higher risks with new changes**
  - Unit/Plant Start-Up
  - Shutdown and Maintenance Activities
  - Equipment/process modifications
  - Organisational change
  - Addition of new unit/system/technology
  - Shift handover

PRBI Process





Work Process for Plant/Unit Start-UP



Engineering Management of Change

Important to Build Competencies to Uphold Process Safety Standards

- Individual
  - Subject Matter Experts such as-
    - Engineering Design
    - Process Technology – inherent process safety
    - Maintenance (Mechanical Integrity)
    - Equipment specialist

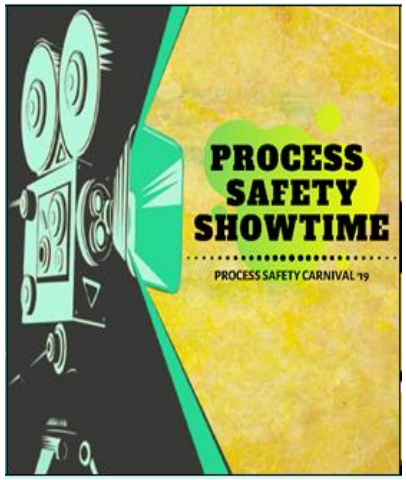
- Organisation
  - Learning Organisation
  - Technical Authority – important prior to introduce change
  - System and Process for Compliance Assurance

Classroom

Culture Launching

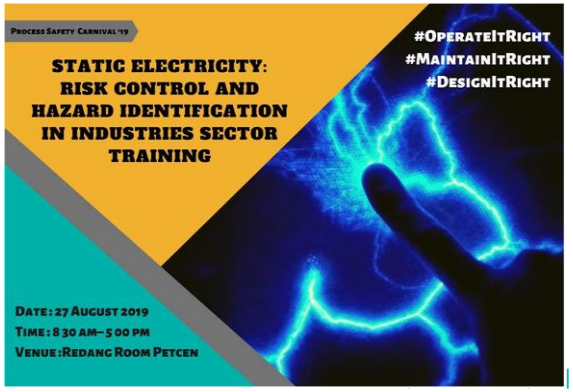
On Job Training

More Creative and Innovative Approach Required in Building Competencies



Edutainment

Technical Knowledge



Culture Transformation

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More Creative and Innovative Approach Required in Building People Competencies

***Learning** from Past Incidents and **Application** of Lesson Learned*

- **Leaders drive the organisational culture**
- **Leaders set the pace for organizational learning**

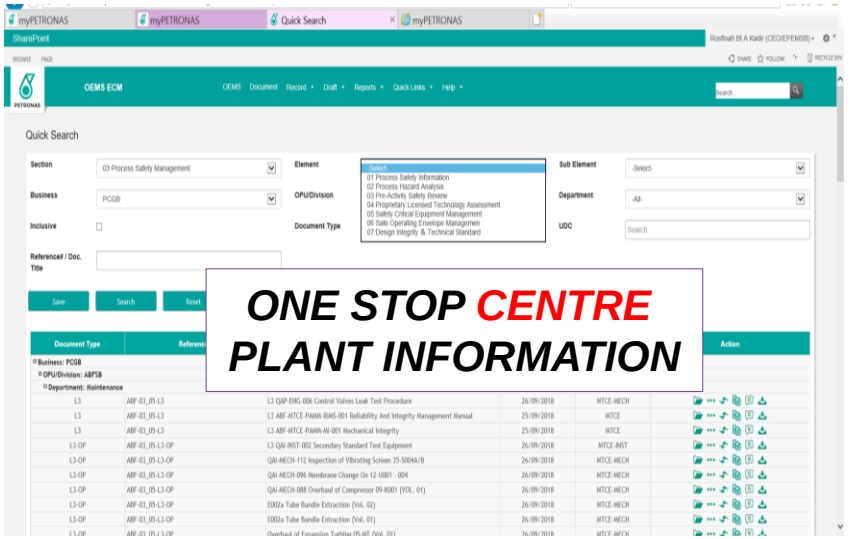
Sharing Correct Practices

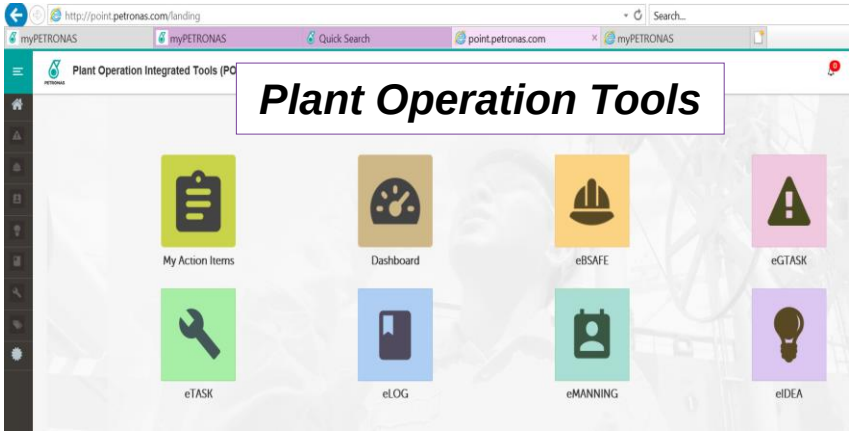
Leadership Conversation

- **Leaders should provide the platform for sharing of lessons learnt from past incidents**
- **A system should be established for tracking of closure and application of lessons learnt**
- **Localised Learning is usually the most effective approach**

Importance of Digital System in Building Competency

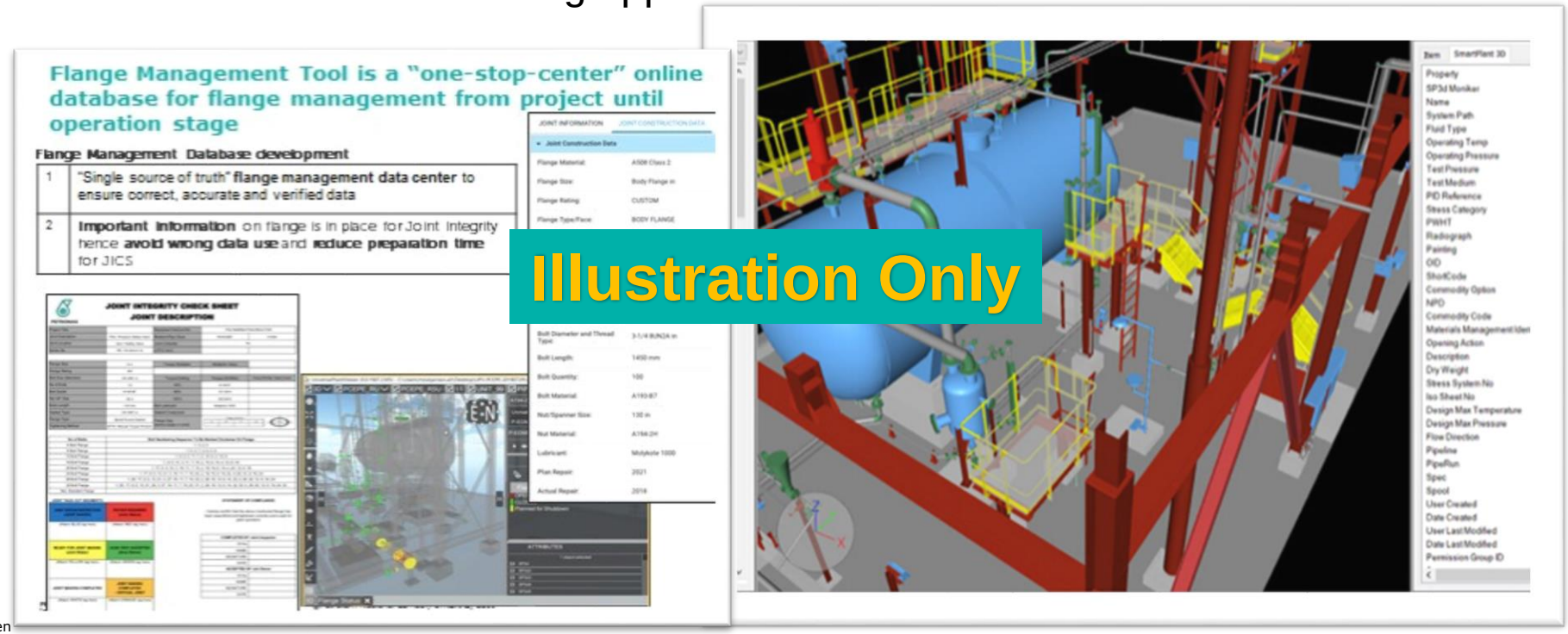
- Process Safety Information is important for plant personnel to execute the work safely.
- The availability and accessibility of the required information to relevant personnel when needed are crucial
- Relevant infrastructure should be made available
- Establish a Management System Review to measure the effectiveness of implementing Process Safety





Selection of the Right Digital Tools helps to Reduce Risk of Process Safety Incidents

- Correct information made available to avoid process safety incidents due to wrong selection e.g.
  - Location of work
  - Type of hazards
  - Type of gaskets
  - Torqueing value to be used
  - Standards and Rating applied



Building and Maintaining Process Safety Competency

- Establish an environment where people continue to seek process safety knowledge and build competency
- Availability and easy accessibility of correct Process Safety Information for those who need them – e.g. by utilisation of digital system
- Continuous Learning from Past Incidents or Inherent Technology

- Establish a tracking system that ensures consistent application of what has been learnt
- Continuous improvement from improved technology or application of improved barriers

Conclusion

Reminder to Myself and All Leaders

- We as Leaders are accountable in ensuring Process Related Matters are properly addressed in our organization.
- Our Approach May Differ, but Our Goals are the same.
- To develop the individual and strengthen organisation competency is crucial to prevent major hazards due to Process safety Incidents.
- Process Safety Competency requires Skills, Knowledge and Passion.
- Design It Right, Operate It Right, Maintain It Right!

Thank you for your passion!