PHA Project to LIVE status and Case Studies on Deviations

Geetali Thakur

Head – HSE Deccan Fine Chemicals (I) Pvt Ltd, Goa, India

Content

- PHA at project stage
- Commissioning pre startup review
- Managing changes
- Case studies deviations

Disclaimer

The statement, opinion, observations and predictions are solely that of the presenter and do not necessarily represent official policy or position of Deccan Fine Chemicals I Pvt Ltd (DFCIPL).

The opinion, information presented here in are of the presenter and DFCIPL attracts no liability to the completeness of this information.

Case studies used in this webinar are not real incidents that have occurred anywhere in the industry and are solely presented for academic purpose of knowledge gain.

OSHA 1910.119 Standard

1910.119(e) Process hazard analysis.

1910.119(e)(1)

The employer shall perform an initial process hazard analysis (hazard evaluation) on processes covered by this standard. The process hazard analysis shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process. Employers shall determine and document the priority order for conducting process hazard analyses based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process. The process hazard analysis shall be conducted as soon as possible, but not later than the following schedule:

Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (MSIHC)

Schedule 8 – Information to be furnished in a Safety Report

- (5) Information on the Preliminary hazard Analysis namely-
 - (a) type of accident
 - (b) system elements or foreseen events that can lead to a major accident.
 - (c) hazards
 - (d) safety-relevant components

Process Hazard Analysis



PHA- A tool to dig the undug

Explore Q1 – Common Hazards:

Fire, explosion, run away reaction : Industry Best practices

Explore Q2 – Blind:

Literature, incidents in industries

• Explore Q3 – Hidden:

Relate with other processes, check what controls worked – can we emulate?

Explore Q4 – Unknown:

Chemical Reactive hazards test to be performed?

The Johari Window

1 Open	2 Blind
Known to self and to others	Not known to self but known to others
3 Hidden	4 Unknown
Known to self but not to	Not known to self or others

Different Layers of Controls



PHA at Project Stage

- Initial Project Risk Assessment
- Pre Hazop Review
- Hazop



Review of changes during project and reassessment

Reference: https://www.aiche.org/ccps/resources/tools/risk-analysis-screening-tool-rast-and-chemical-hazard-engineering-fundamentals-chef

Commissioning pre startup review – typical checks

- Updated Process Hazard Information
- PHA residual actions on track
- All statutory approvals obtained
- P&ID check actual vs planned
- Cleaning validations
- Isolation checks for multi product

- SIS system loop check and test
- Software loops checked
- Software interlocks tested
- Mitigative measures trials as applicable
- Emergency response preparedness
- Safe systems of work

Managing Changes – MOC

MOC Implementation

- Develop written procedures for managing change
- Implement MOC Procedure
- Address the technical basis for each change
- Evaluate potential safety and health impacts for each change
- Control the duration of the change (if temporary)
- Address the need for "emergency" changes
- Define/implement requirements for authorizing changes to be made
- Appropriately inform and train affected employees and contractors before changes occur
- Update any process safety information affected by the change
- Update any procedures (including safe work practices) affected by the change

MoC and relevant documentation and updates

Sr. No	Change	Is it a change?	Important documents (not restricted to)
1	SS reactor changed to MSGL same capacity	Yes	MoC Compatibility chart P&ID Hazop MoSCE (Safety critical equipment)
2	Change of Utility from one variant to another	Yes	Chemical Compatibility MoC Compatibility chart P&ID Hazop
3	Implementation of Hazop actions – SRV installation	Yes	Relief calculations P&ID Hazop
4	Like to like change of a vessel	?	?

Poll Question -1

Is it required to update PHA in case there is change in sampling methodology for a product?

Yes

No

Example: As part of initial PHA <u>No sampling</u> of intermediate was planned. Sampling planned after first few batches. This material was shock sensitive. No MOC was raised.

Operator did not know and happen to take out sample, rinse it to ensure no contamination before filling representative sample. The glass bottle could lead to small blast leading to shatters of glass pieces and thus injury.



Poll Question -2

Q: Which level of control was missed in this case? Engineering Or Administrative?

A : It is almost impossible to control vent header mix-up when lined to same source – thus right design was important.



CASE 2: Shutdown cleaning



Poll Question - 3

Q: Which level of control was missed in this case? Administrative or Engineering?

A : P&ID mark up during shutdown was missed and accordingly P&ID checks pre start up.



CASE 3: Replacement of Like to Like





Poll Question-4

Q: Which level of control was missed in this case: Adminstartive or Engineering?

A : Vent should not have been common





CASE 5: PHA Not updated





Source: <u>https://www.industrialpackaging.ie/product/ibcs-</u> <u>explosive-zones</u>

Poll Question - 5

Can this be a hazard with conducting liquid too?

Yes

No

Yes, there can be as conducting liquid in non conducting vessel travelling long distance which needs to be grounded to dissipate static charges.

Thank You

Geetali Thakur Head – HSE Deccan Fine Chemicals (I) Pvt Ltd, Goa, India

B.E (Chem), MBA(Ops), LFOH(BOHS-UK), ADIS geetali.thakur@deccanfinechemicals.com

