



तेल उद्योग सुरक्षा निदेशालय Oil Industry Safety Directorate

Common Audit Observations

***Vivek Prakash Singh,
Joint Director (Process & Engg)
Oil Industry Safety Directorate***



WE ADD SAFETY

WE WORK FOR YOU, WITH YOU, TO ENHANCE SAFETY.

COMMON AUDIT OBSERVATIONS IN SAFETY AUDITS OF REFINERIES

- **Oil & gas industry is well equipped with latest technologies and systems for ensuring safety:**
 - Modern firefighting/ protection gadgets – High-Volume Long-Range Monitor (HVLRM), Medium Expansion Foam Generator (MEFG), Remotely operated shutoff valves (ROSOV)
 - Hydrocarbon detectors/ smoke detectors/ infra red flame detectors/ open path detectors with motion sensors & pairing with deluge systems
 - Emergency Shutdown (ESD)/ Manual Call Point (MCP) for early warning & responsive action, surveillance through CCTV etc.
 - Process safety management (PSM) implementation
 - Fire Retardants clothing for working personnel
 - Use of Artificial Intelligence (AI) and Virtual Reality (VR) based software for training.
 - Use of drones for inspection of inapproachable locations like flare tip, stacks etc.

SCOPE OF IMPROVEMENTS IDENTIFIED THROUGH OISD SAFETY AUDITS

SCOPE OF IMPROVEMENTS

➤ Audit methodology of OISD:

- Field visits as well as audit through video conferencing by OISD auditors.
- Discussions on safety issues, pending ESA recommendations
- Inspection and review of records/ documents.
- Checks on systems and procedures.
- Checking compliance of Safety Management System.
- Conducting mock drill.
- Sample checking of implementation of OISD standards.
- Checking of statutory licenses/approvals.
- Feed back to Management on concluding day highlighting areas of appreciation and suggesting areas of improvement.

➤ Non-adherence to Management of change (MOC) procedure:

- Modifications done without raising MOC request.
- MOCs implemented but relevant documents not updated
- Change of person not covered under MOC procedure.
- Changes in trip/ alarm setting without MOC.

➤ Non-adherence to interlock bypass procedure:

- Inexplicit interlock bypass policy
- Interlocks bypassed for long durations without approval
- MOC not raised for very long duration interlock bypassed

➤ Gaps in reporting of incidents

✓ Near Miss/ Unsafe acts/ Unsafe conditions

- Less number of reported near miss despite massive project activities
- Unsafe acts/ unsafe conditions not reported or clubbed with Near Miss cases
- Inadequate system for reporting near miss / unsafe condition by contract workers

✓ Process safety events

- Process safety events not being reported.
- Process safety events neither categorised (Tier I/ II) nor investigated

➤ Gaps observed in layout

- Not meeting stipulated Inter-distances between various units/ facilities
- Non blast proof porta cabins/ field operator cabins provided in hazardous area

➤ Gaps observed in safety instrumentations

- Non availability of automatic shutdown body valves in tanks in case of receipt from SPM, Jetty and pipeline receipt at high flow rates
- Non availability of Auto start/ Stop provision and emergency power supply for CBD/ flare KOD pumps
- Motor operated valves (MOVs) in place of automatic shutdown valve (ROSOV) installed at column bottom (fluid at auto ignition temperature). actuators and Cables of MOVs not fireproofed.
- Emergency shutdown push buttons of Gantry/ Heaters provided within 15M

➤ Gaps in work permit system :

- Single permit for multiple tasks at different locations
- Job safety analysis not carried out by multidisciplinary team
- Inadequate Supervision & Toolbox talk
- Cold work permits / inadequate precautions in opening of pyrophoric lines
- Hybrid work permit systems (Authorisation online but permit offline)

➤ Gaps in Standard Operating procedures :

- Poor compliance / Non availability of SOPs
- Awareness / Refresher training of SOPs inadequate
- SOPs not updated/ reviewed on schedule
- SOPs not standardized across corporation

➤ Gaps observed in Fire fighting :

- FW sprinklers not provided for the uninsulated vessel (volume >50 M³)
- FW sprinklers not provided for pumps handling class A product / fluid above auto ignition temperature.
- Automatic FW sprinklers not provided for LPG/ Propylene pumps.
- Fire water spray systems not installed for Transformers more than 2000 Liters Oil capacity or 10 MVA

➤ Gaps observed during Mock drill

- Poor upkeep of sprinklers, Fire water headers, MCP etc.
- Fire water / Foam coverage inadequate
- No firefighting action by operating crew till fire crew arrival

➤ Gaps in HAZOP/ QRA / ERDMP

- Not revised as per scheduled frequencies
- ERDMP Not covering all QRA credible scenarios
- Long pending recommendations of HAZOP/ QRA
- Quality of QRA not adequate

➤ Other miscellaneous observations:

- Blinding philosophy as per P&D not strictly followed for equipment drain to CBD and OWS.
- Non availability of peripheral drain in tank dyke
- Non availability of Break-away coupling in the LPG loading arms
- Non availability of Closed / Close loop sampling provision for all HC and Toxic fluid

➤ Gaps observed in Asset integrity

- Internal inspection of Tanks overdue without corrosion assessment of bottom plate
- Overdue testing of pressure safety valves / Pressure vessels/ Lifting tools
- Long pending Inspection Recommendations.
- Unavailability of colour coding of piping (HC & Utility lines same color)
- Poor maintenance & inspection of piping going outside premise / under culverts
- Large numbers of clamped hydrocarbon piping

➤ Gaps observed in electrical system

- Gaps in LOTO (lock out tag out) system for Electrical Energization / De-Energisation
- Gaps in FLP integrity of JB's / Panels :- Missing bolts, unplugged cable entry.
- Cable trays going over hydrocarbon pipe racks without GI sheet covers
- Non flame proof fittings observed in hazardous areas like Battery rooms, sample retention rooms etc.
- Gaps in earthing system

COMMON OBSERVATIONS- PETROCHEMICAL

- **Disregard to SOPs** : Inadequate flushing of TEAL lines / Tanks and deactivation of diluted mixture
- Improper disposal of diluted TEAL and improper Peroxide handling
- **Work permit philosophy** : Cold work in TEAL lines may be considered as hot work due to inherent pyrophoric nature of TEAL. Incident happened during cold work in TEAL lines
- **Inadequate deactivation procedure of bag filters** causing fire & explosion in guard filters due to pyrophoric traces.
- FW sprinklers provided instead of **DCP flooding system** in TEAL storage area.

COMMON OBSERVATIONS

➤ Gaps in internal controls

- Quality and coverage of internal audits
- Effectiveness of daily checklist
- Inadequate inspection by Management & senior officers
- **Non sharing of incidents & learnings** : Incidents / existing plant hazards not discussed in safety committee meetings. Lack of awareness of recent incidents.
- Non-Horizontal deployment of audit observations/ incident recommendations



THANK YOU

FOR LISTENING