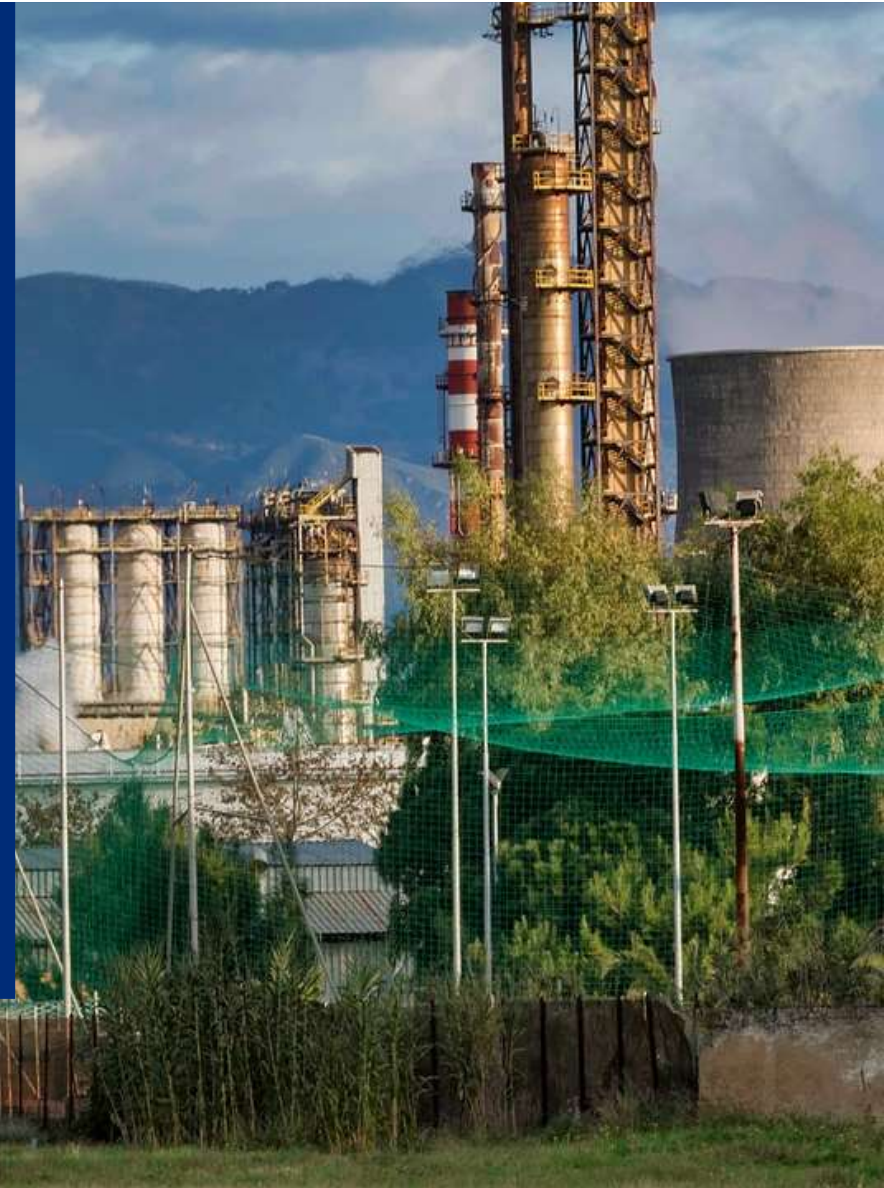




Marsh Specialty International Best Practices on Safety Management



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Global Oil & Gas Industry – Best Practices

Loss Prevention Measures



Defeat of Safety Instrumented Systems & Alarms

- Formally **risk assess** each override.
- Ensure time-based authorization and escalation for higher approvals (ideally 1 to 4 weeks).
- Route **long term overrides** through Management of Change system.
- The alternate safeguards / mitigations must include prompts for what?, Why?, How?, and When?.

Industry Losses – *Polymer Plant, US (2004), Chemical Plant, US (2009)*



Permit to Work Safeguards Isolation Management

- Develop **minimum isolation philosophy** for all types of non-routine work (refer HSG 253).
- Correctly identify all the required isolations related to permit to work using latest drawing,
- **Isolation certificate system** for managing all types of isolations.
- Cross referencing of permit to work with all types of isolation that may be applicable.
- Secure all types of electrical, process, and mechanical isolations using Lock and Tag (LOTO).

Industry Losses – *Piper Alpha (1988), UAE Refinery (2017)*



Management of Change (MoC)

- Include **Formal closeout section** as part of MoC workflow.
- Ensure **Temporary MoCs** are risk assessed and reviewed before their validity expires.
- Pre-Start Up Safety Review (**PSSR**) must be integral part of MoC process.
- Report KPIs related to MoCs

Industry Losses – *Flixborough Explosion (1974), Grangemouth Refinery explosion (1987).*



Maintenance & Inspection Deferral Management

- Develop a **formal deferral procedure** covering scope, approving authority, and workflow.
- Deferrals should be driven from process safety and asset integrity perspective.
- Deferrals must go through **technical reviews** by a multidisciplinary team.
- For **Mass Deferrals (Turnaround)**, extensive reviews must be conducted for each piece of equipment.

Industry Losses – *Natural Gas Pipeline, Canada (2018).*

Global Oil & Gas Industry – Best Practices

Loss Prevention Measures



Temporary Repairs Management

- Route all temporary repairs through **detailed risk assessment**, and mention frequency and type of inspection, and retirement life.
- Operations team must have a list of all temporary repairs in their unit for **Operators to inspect** during field rounds.
- Inspection department to **maintain a list of temporary repairs**, with unique identification number and report their status as a Process Safety KPI.

Industry Losses – USD 515 million loss resulting from VCE due to inadequate weld repair.



Firewater Systems

- All firewater pumps must be in automatic / remote mode.
- **Weekly tests** – electric pump (10 minutes), diesel engine (30 minutes).
- **Annual performance tests** as per NFPA 25 at shutoff, 50%, 100%, and up to 150% of rated flow.
- **Plot performance curves** against factory curve and monitor deviations versus acceptance criteria.
- Development of **Impairment procedure** for fire protection systems.

Refer to NFPA 25



Process Safety Performance Indicators (PSPI)

- Identify metrics to understand the effectiveness of critical Process Safety barriers.
- Measure **both Leading and Lagging** Indicators.
- Introduce **color coding** (red, orange, and green) to give quick indication of the performance and identify focus area
- *Refer to HSG254, API 754, CCPS guidelines*

Industry Losses – BP Texas City refinery incident (2005), BP Grangemouth incidents (2000)



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