

# Mega Conference on " Pioneering Technical innovations for a Safe tomorrow "



## **Technical Session:**

**Embracing PSM and developing Key Performance Indicators for safe, smooth & uninterrupted operations**

16-17 Dec'24

# Risk Management Importance

## Process industry disasters were due to barrier failures:



Piper alpha



Alexander Kjelland,



Bhopal



Texas City



BP Oil Spill

“Each facility was thought to be “safe”:

... at design

... during operations

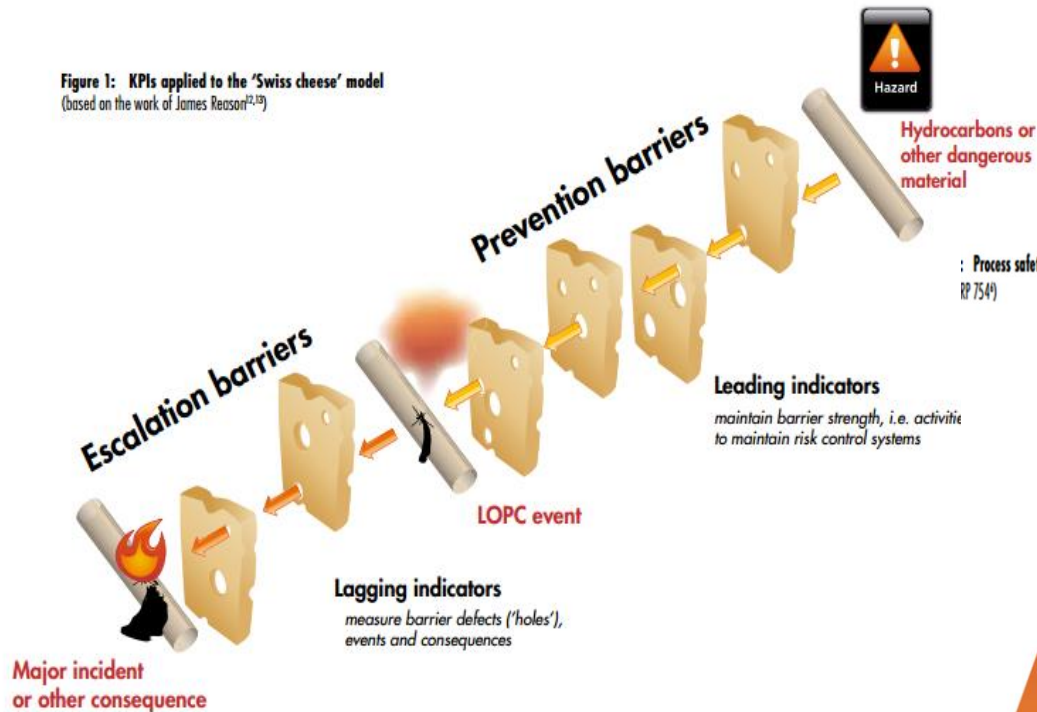
... barriers left insufficiently managed

*History is no indication of future performance and returns are not guaranteed. Past good performance is no guarantee that incidents will not occur in the future.*

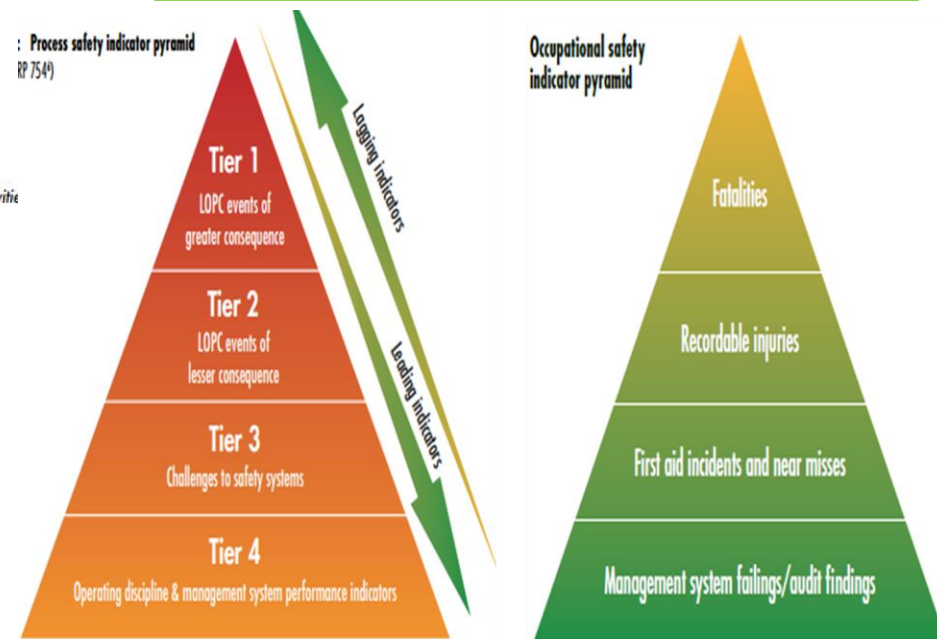
# Why implement Process Safety KPIs

Plan-Do-Check-Act cycle is a useful model for continuously improving the performance of the process safety management system.

Figure 1: KPIs applied to the 'Swiss cheese' model  
(based on the work of James Reason<sup>22,19</sup>)



- Major incidents are the results of not one but the combination of failure of barriers identified to maintain the integrity of the system
- Tier 1 & 2 are the lagging indicators
- Tier 3 & 4 are leading indicators



Source: OGP

*Properly selected metrics that fit with the detailed objectives of an organization will identify the successes and point out the weaknesses of the system.*

# Strategy: Think Beyond Standard KPIs

- Lagging and leading indicators are both important. To know where you're going, you need to know where you've been. The line between leading and lagging indicators can be blurry, and the distinction really comes down to how we're using any particular indicator.
- Common metrics provide a base set of KPIs that every business should monitor, but you need metrics that speak specifically to your situation:
  - your most pressing problems
  - the challenges you wish to solve
  - the diagnosis you've made about gaps in PSM
  - and how you can know your proposed KPIs are capturing it
- Inputs for defining KPIs
  - Company Goals and Objectives
  - Performance report: What Works Well and What Does Not
  - Baseline surveys
  - Incident Investigation Results
  - Local regulations
  - Audit and assessment outcomes
- Engage all relevant functions for validating objectives and KPIs

*KPIs Shall relate directly to process safety objectives and provide accurate performance information.*

# Typical dashboard: KPIs

Business activity



Organisation KPIs: Fatality /Serious Injuries, Zero Public reactions, Pending compliance

Segment



Tier1 and tier 2 events and its benchmarking ,Compliance to regulatory requirements, Open High-Risk Recommendations, High Value Learnings

Facility



Overdue MOCs/ drills/ incident investigation / PM orders, LPR rules status, Meetings with contractor owners. Overdue High- and Medium Risk recommendations, Leadership engagement

Plant



Overdue maintenance SCE, Total no interlocks bypassed, MOCs not closed/ regularised, Emergency drills/ planned vs actual, internal audits status,, Training and competency, Resource gaps, Risk register update, PHA overdue, Safety observations, Impaired barriers , LOPC events

Shift



Permits issued/ person , No. Of Interlock bypass, No. Of control valve bypass open Standing alarms, IOW alarms, Impaired Barriers, **No. of OLS**, Leaks/ spills in a shift, Injury in shift, Primary Seal Leak, Lube oil level in the tank/ seal pot, Equipment Not available, Nonfunctional steam traps, Emergency MOCs, No of spurious alarms

*KPIs that do not results in actions to improve performance are not just waste of efforts but can reflect in false sense of confidence*

## Key action while when reviewing a KPI

- KPIs shall be dynamic and shall vary based on performance ( positive or negative).
  - Raise the target of the KPI or Substitute the KPI with new one based on the results achieved, meeting the Goal of the organization
  - Adequacy of these indicators is verified through the performance analysis of Process Safety.
  - One important pitfall what we observe is “Chalta hain” or tick the box culture. People try to manipulate the indicators defined by themselves giving false sense of assurance.
  - People try to downplay reporting when lagging parameters are linked to annual performance of employees. Loses the opportunity of acting on warning signals

*Poor quality data leads to poor decisions. Adopt a philosophy of “trust but verify.”*

# Summary

- Leading indicators aren't the medicines which will cure the disease forever . They'll work only if you take the time to choose them well, based on your own analysis of your most relevant safety issues and their contributing causes
- Defining and tracking the indicators is very important task at every level of management from field operator to the Board room of the Organisation
- Ignoring symptoms Means,
  - deteriorating health of PSM
  - creating threat to general public
  - negative impact on image of the organisation
  - negative impact on credibility of the nation.
- Collaborate to say no to one more Bhopal. Zero harm to human and animals is the part of our heritage culture

PSM hain to Safe hain!!!

Everyone Goes Home safely



Thanks