



*Energising a Brighter Tomorrow*



**DATA SUCCESS STORIES - KEEPING PROCESS  
SAFETY PROGRAM ACTIVE THROUGH LEADING  
& LAGGING INDICATORS.**



### HPCL

- A 'Navratna' Public Sector Undertaking and a 'Fortune 500' company
- HPCL is one of the largest oil refining and marketing companies in India owned by Gov. of India

### MEIL

- MEIL is a 100% subsidiary of Mittal Investments Sàrl, beneficially owned by Mr. Lakshmi N. Mittal and family.
- Mittal Investments Sàrl is engaged in building a portfolio of oil-and-gas assets

# HMEL.....



On-time completion within 48 months setting a global benchmark.

Largest investment in Punjab.

Competitive cost for project of such magnitude & complexity.

More than 200 million man-hours have gone into the construction and commissioning.

Among highest yields of propylene and almost twice that of earlier processes.

	<b>1 Single Point Mooring (SPM):</b> For handling VLCCs 7 km in the sea.
	<b>2 Crude Oil Terminal:</b> 14 crude tanks of 60,000KL each & 4 blending headers.
	<b>3 Crude Pipeline:</b> 1017 km underground pipeline sized to carry 18 MMT of crude.
	<b>4 Complex Refinery:</b> Best in class refinery recently expanded to 11.3 MMTPA.
	<b>5 Captive Power Plant:</b> Power plant with gross capacity of 165 MW.
	<b>6 Polymer Unit:</b> PP unit with design capacity of 467 KTPA (multiple grades).

# Safety Moment





GURU GOBIND SINGH REFINERY  
HPCL-MITTAL ENERGY LIMITED



# HMEL Process Safety Management

COMMITTED  
TO PROCESS  
SAFETY

UNDERSTAND  
THE HAZARD  
& RISK

MANAGE RISK

LEARNING  
FROM EXPERIENCE

PROCESS SAFETY CULTURE

EMPLOYEE PARTICIPATION

PROCESS SAFETY INFORMATION

PROCESS HAZARD ANALYSIS

OPERATING PROCEDURE

MANAGEMENT OF CHANGE

PRE STARTUP SAFETY REVIEW

CONTRACTOR MANAGEMENT

MECHANICAL INTEGRITY

TRAINING & PERFORMANCE ASSURANCE

SAFE WORK PRACTICE

EMERGENCY RESPONSE

INCIDENT INVESTIGATION

COMPLIANCE AUDIT

PERFORMANCE MEASUREMENT

MANAGEMENT REVIEW

Vision – Incident & Injury Free Workplace

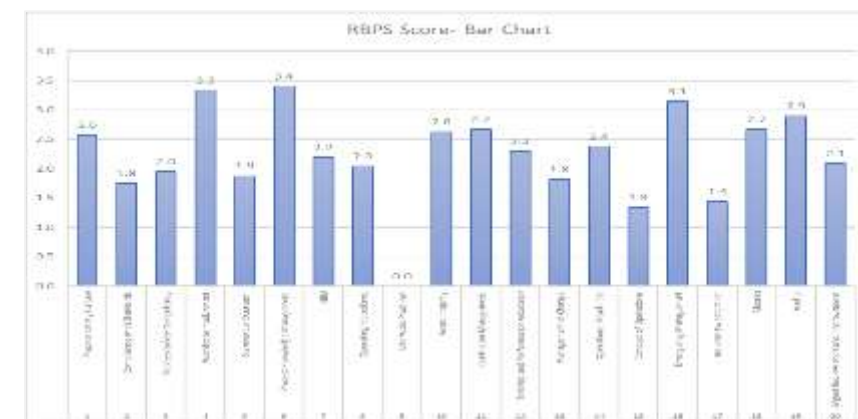
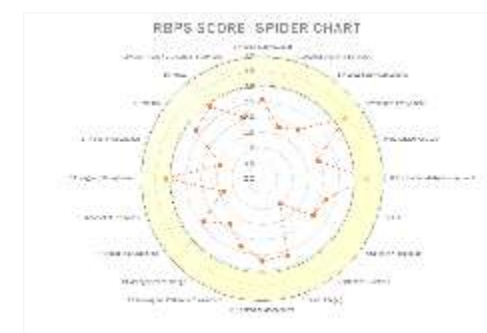
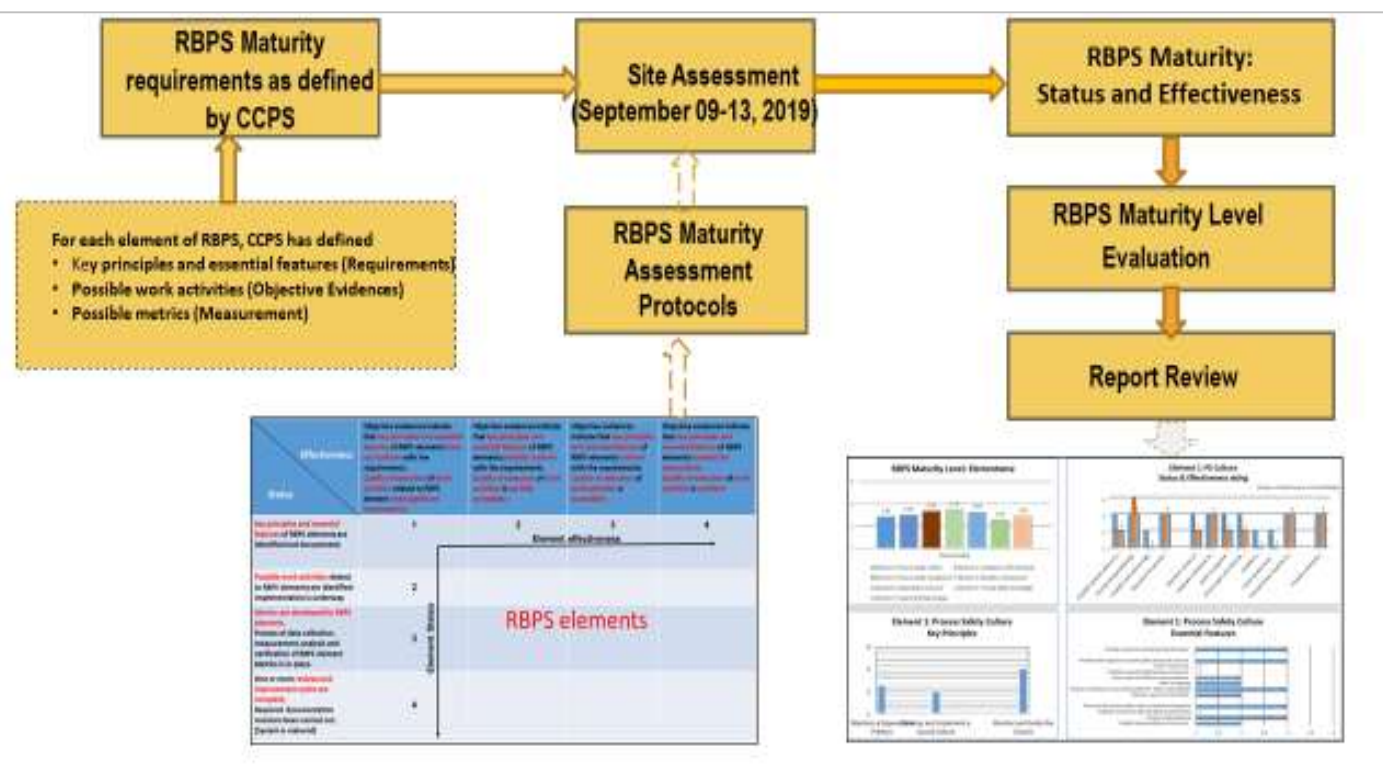
# HMEL – Process Safety Management



# HMEL – Process Safety Management



## CCPS RBPS Maturity Assessment



# PSM Performance Indicator.



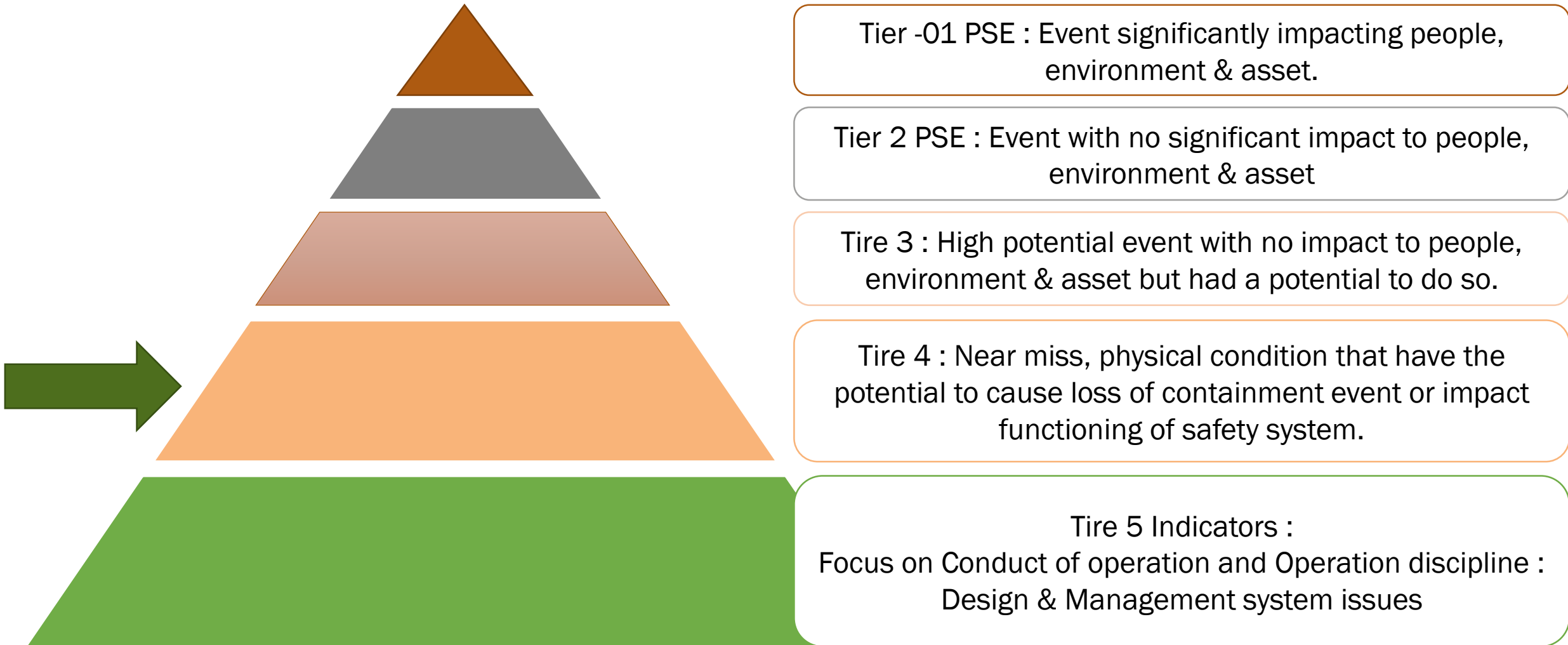
## Lagging Safety Indicators

- After the incident
- Quantitative
- Injury rates, fatalities, compensation claims

## Leading Safety Indicators

- Before the incident
- Qualitative
- Staff surveys, safety audits, safety training

# Process Safety Incident reporting Pyramid



# Process Safety Near-miss, Unsafe act and condition.



These are the Event or Condition or Act which not results in significant quantity of loss of containment of process fluid but had a potential to do so.

- 1- Loss of containment of process fluid. (very minor.....)
- 2- Physical condition contributing to failure of primary containment.
- 3- Physical condition could affect performance of hardware safety system.
- 4- Human error producing conditions. (Monitoring equipment malfunction, sign display error ,procedure error)
- 5- Individual act could lead to occurrence of process safety event or impact performance of safety system.

# Process Safety Near-miss, Unsafe act and condition.



Unsafe condition	Sub Category	Unsafe condition	Sub Category	
Loss of containment (Very minor)	LOC - Water	Damaged or inadequate Tools /Equipment's.	Damage/Improper /no earthing	
	LOC - Hazardous material (Flammable/Toxic)		Device / Equipment Part missing	
	LOC - Utility		Corrosion	
	LOC - Lubricating oil		Instrument/equipment damage	
Inadequate support	Pipeline support		Spec mismatch	
	Cable tray support		Fixed flexible Hose issue	
	Vessel support		Wrong equipment installation	
	Cable dressing		Improper Insulation.	No or damage insulation
	Equipment support			Cladding not done/not secured
Improper Blinds and Bolt	Short bolting		Pipeline/Equipment vibration	Small bore tubing vibration
	Missing bolt	Pipeline vibration		
	End cap/blind missing/mismatch	Equipment/machine vibration		
Malfunction of instrument/equipment	Instrument/equipment not working	Improper Labelling/Tagging	No tagging of equipment	
	Safety System malfunction		Tag /label missing /mismatch	
	Instrument/equipment giving wrong indication			
	Faulty tripping of system			
	Equipment fouling in test bench			

# Promoting culture of process safety near miss, unsafe act and condition reporting



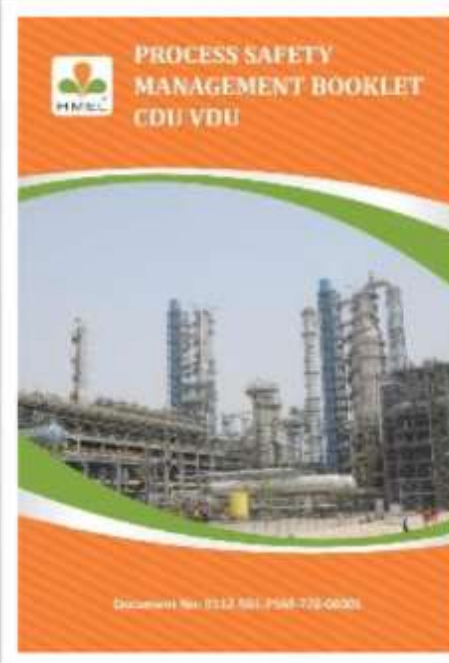
Keep it in Pipeline .....

**Learning from Incident** PSMS 15-009  
**Sudden rise in pressure while leak testing.**

**Incident Description**  
Schedule leak test activity with hydrogen as a part of unit startup was on the way. As planned hydrogen was bleed-up from Hydrogen Risk Gas. Chloride absorber vessel to precool the loop which includes Hydrogen Risk Gas Chloride absorber, H2 rich gas - HP absorber Feed Discharger, High Pressure absorber drum and associated pipeline and filling.  
On previous day an incident, a minor leak was



**PROCESS SAFETY MANAGEMENT BOOKLET**  
CDU VDU



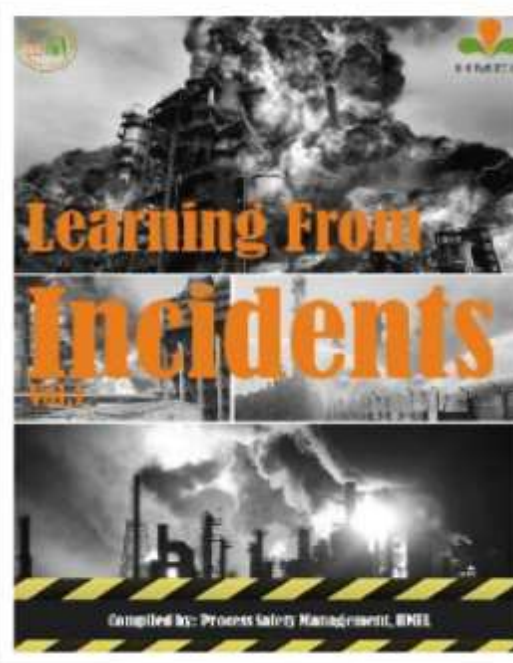
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Process Safety  
**Beacon**



Learn to Beat,  
Not to repeat.....

**Learning From Incidents**




Compiled by: Process Safety Management, H.M.E.L.

**PSID**  
PROCESS SAFETY INCIDENT DATABASE  
From the Center for Chemical Process Safety



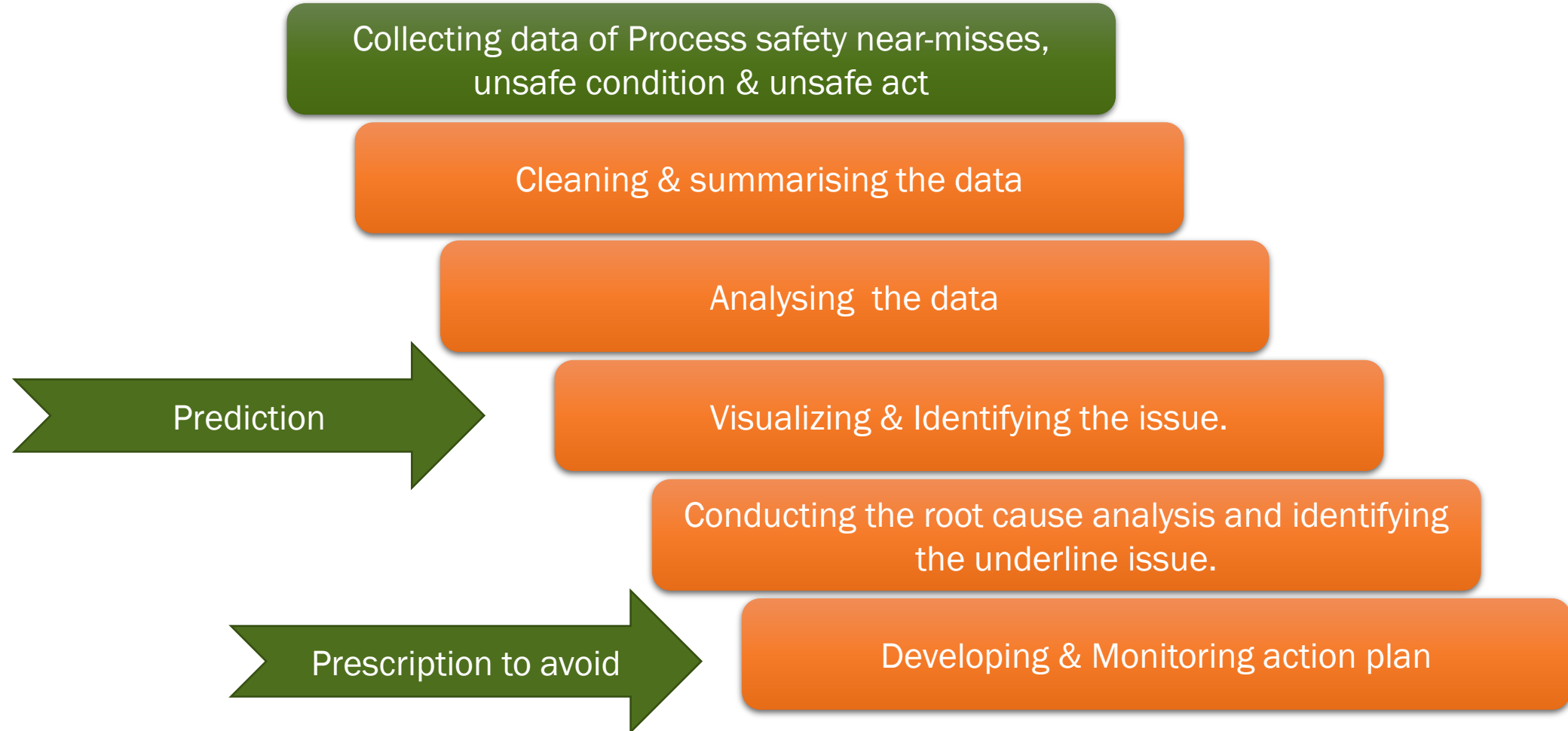
**PROCESS SAFETY SAFE OPERATIONAL PRINCIPLES**

To avoid incidents associated with Hazardous chemicals & Operational activities.

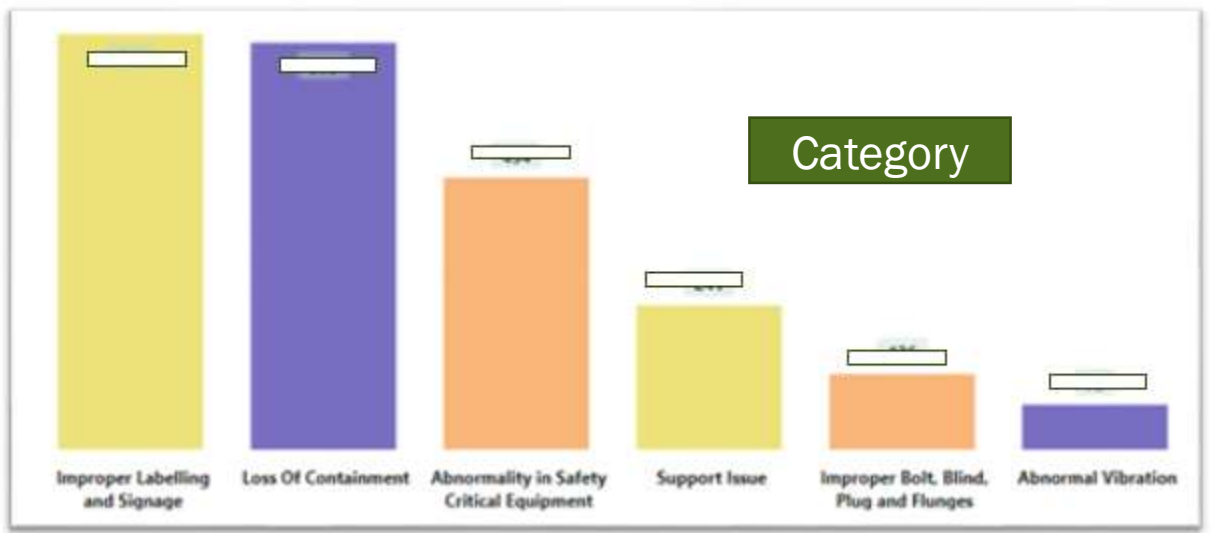


Process Safety Management

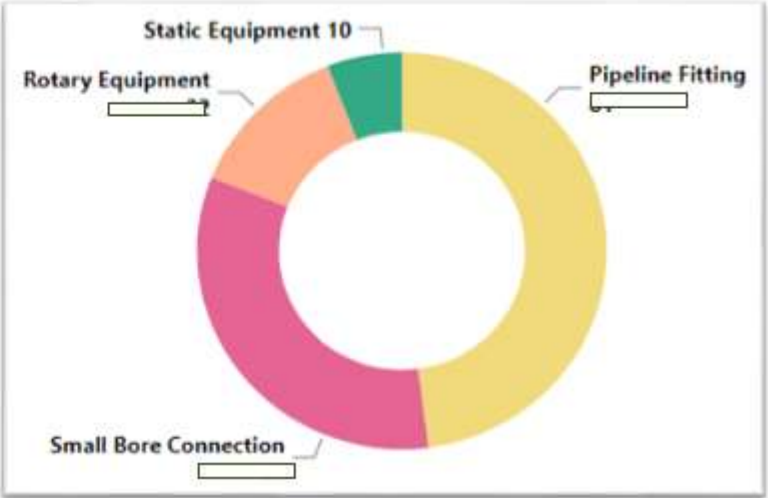
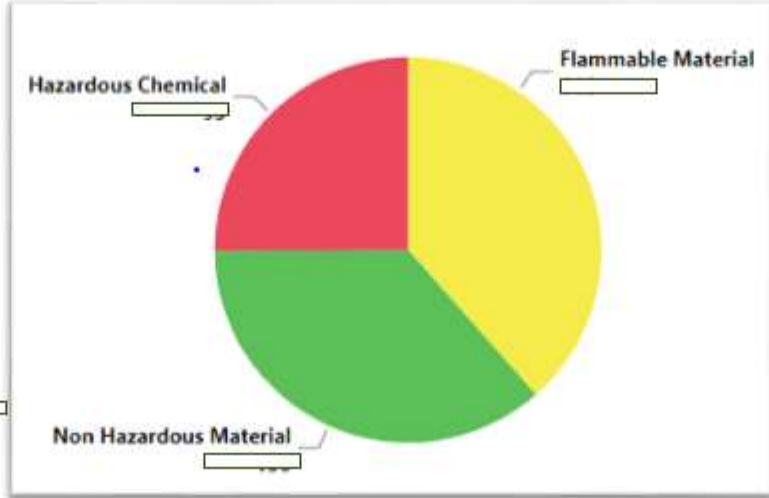
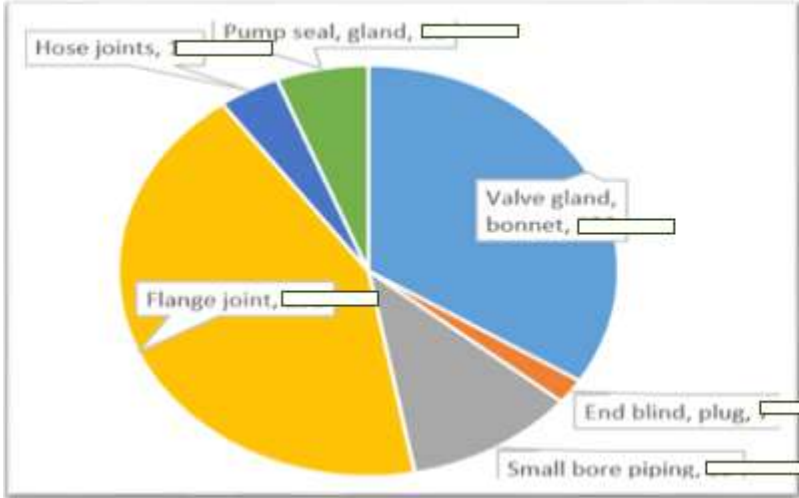
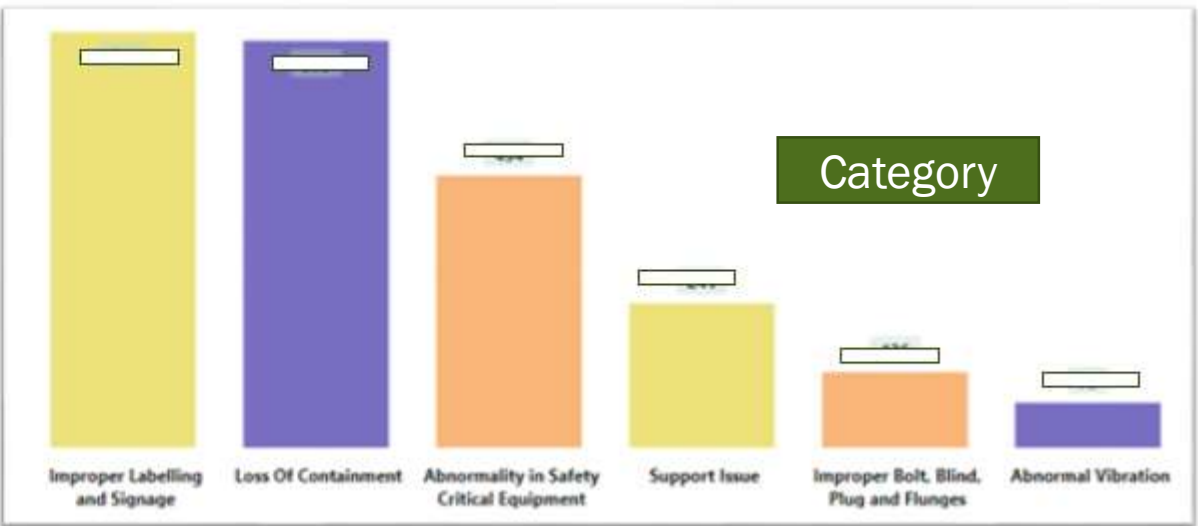
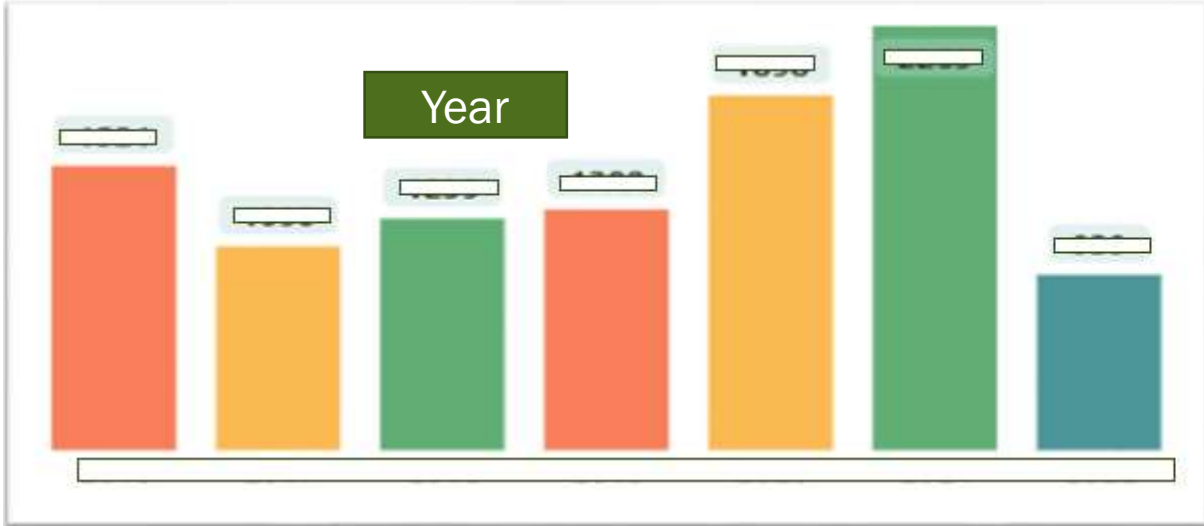
# Process



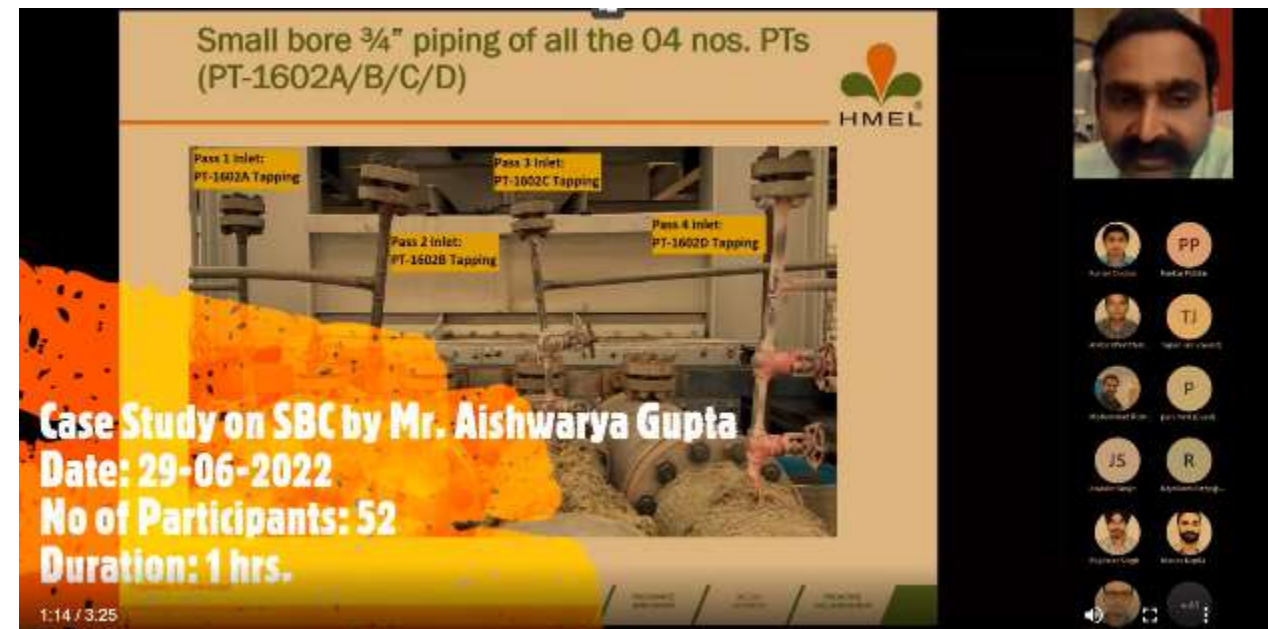
# Process Safety Near miss , unsafe condition data mining.



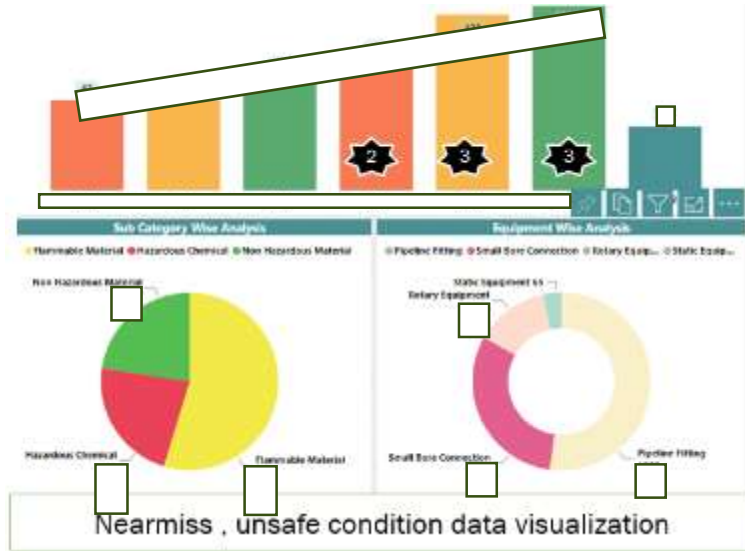
# Visualizing & Identifying the live issue.



# Process Safety Near miss Analysis – SBC campaign



# Process Safety Near miss Analysis - SBC



Stiffeners Issue	%
SBC Vibration	1%
Corrosion	%
Valve or fitting too away	%
Physical Damage/Stress	%
Hammering Required	%
SBC to be remove	%
SBC Obstruction	%
SBC Improper Support	%
Sign of crack	%

Analyse the concern

Issues identified.  
Design, Management system, OD issue.



SBC management system improvement action plan

- Engineering std.
- QAQC management
- MOC
- PSSR
- Operator round.



Thank you

Anshul Tiwari  
Anshukumar.Tiwari@hmel.in