HMEL®

Energising a Brighter Tomorrow

DATA ANALYSIS OF BEHAVIOUR BARRIER IN PERMIT TO WORK SYSTEM

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HMEL.....

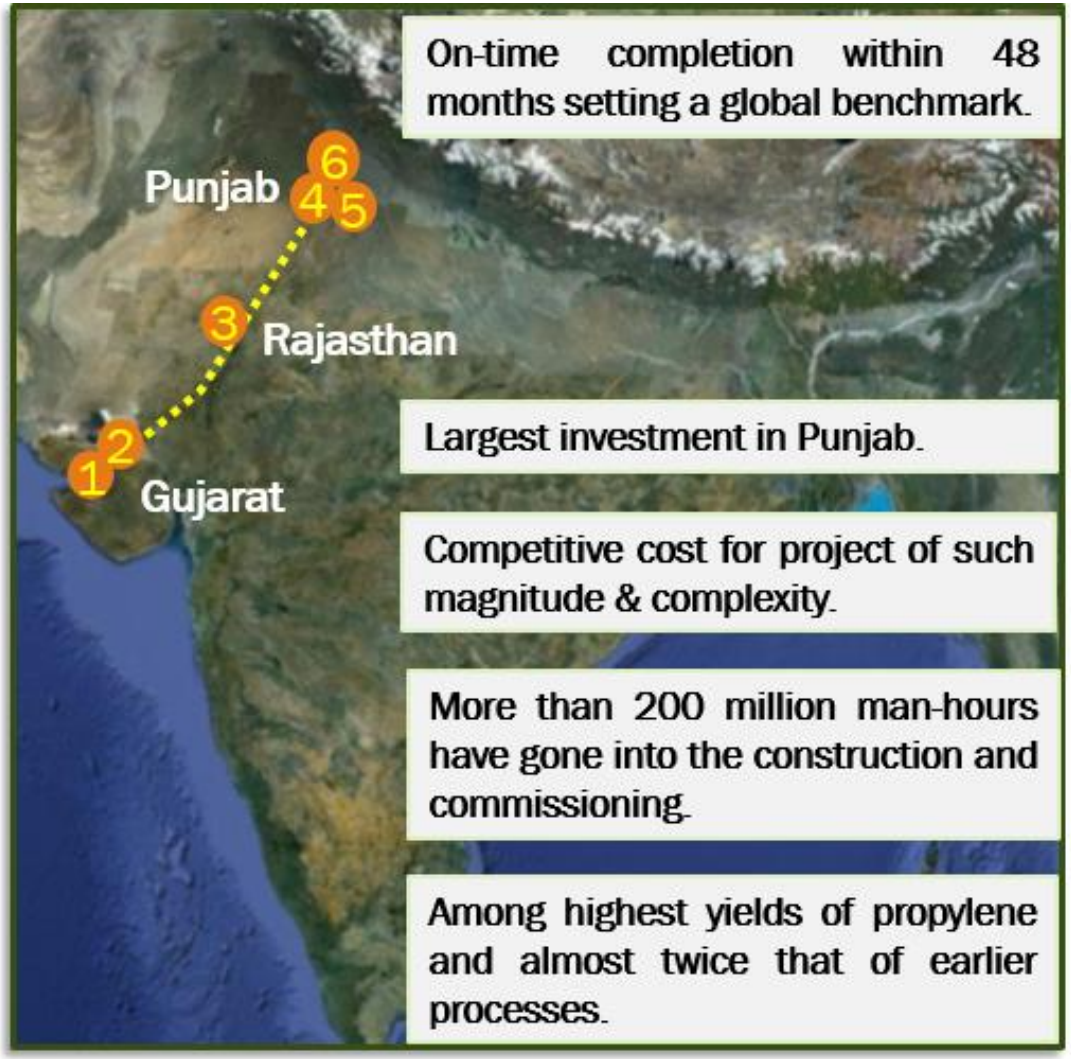
HPCL

- 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.

1. **Single Point Mooring (SPM)**: For handling VLCCs 7 km in the sea.

2. **Crude Oil Terminal**: 14 crude tanks of 60,000KL each & 4 blending headers.

3. **Crude Pipeline**: 1017 km underground pipeline sized to carry 18 MMT of crude.

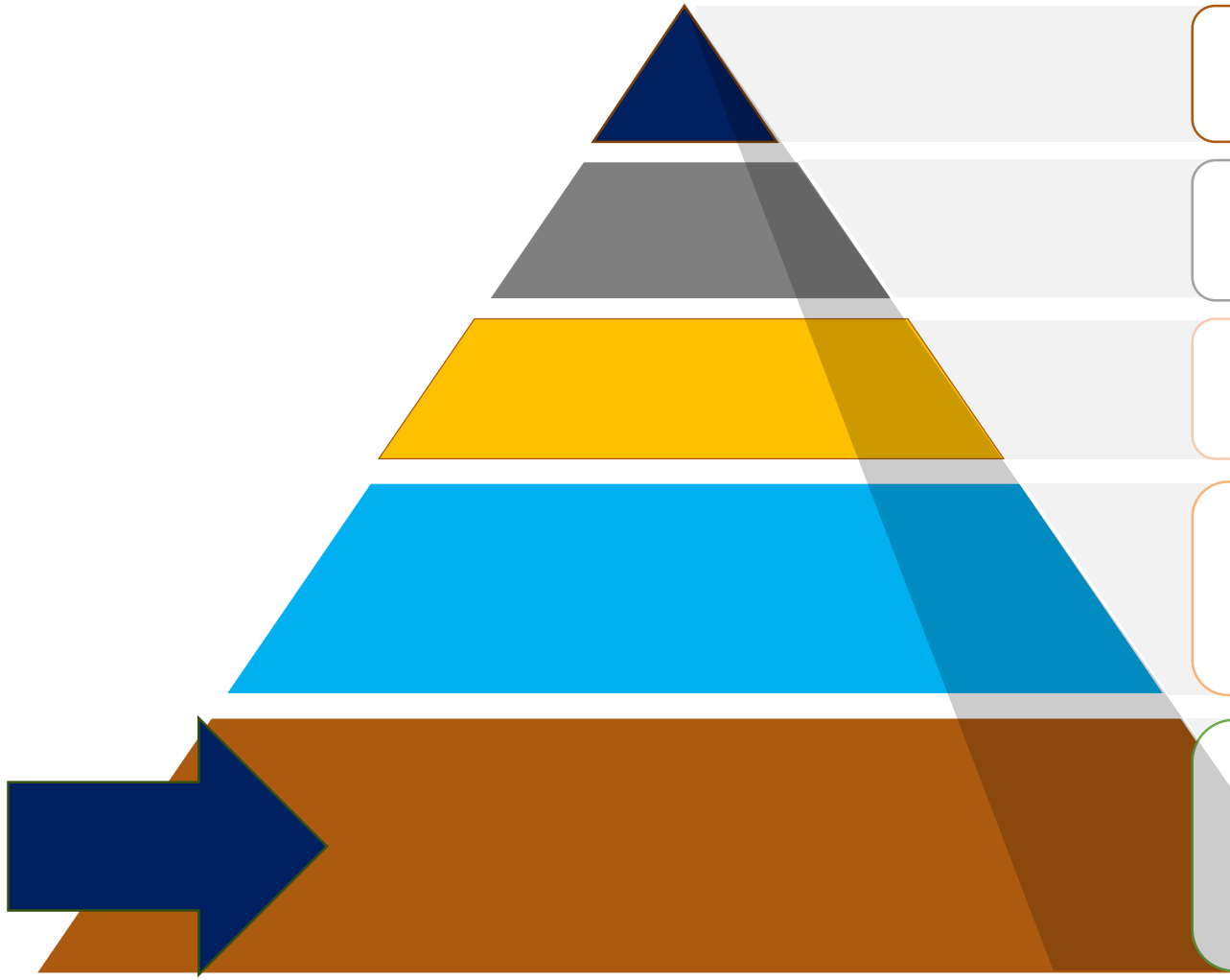
4. **Complex Refinery**: Best in class refinery recently expanded to 11.3 MMTPA.

5. **Captive Power Plant**: Power plant with gross capacity of 165 MW.

6. **Polymer Unit**: PP unit with design capacity of 467 KTPA (multiple grades).


HMEL
GURU GOBIND SINGH REFINERY
HPCL-MITTAL ENERGY LIMITED
DESIGN INTEGRITY
OPERATING INTEGRITY
TECHNICAL INTEGRITY
PEOPLE AND SYSTEM
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

Process Safety Incident Reporting Pyramid



Tier 1 PSE : Event significantly impacting people, environment and/or assets

Tier 2 PSE : Event with no significant impact to people, environment and/or assets

Tier 3 : High potential event with no impact to people, environment and assets but had a potential to do so

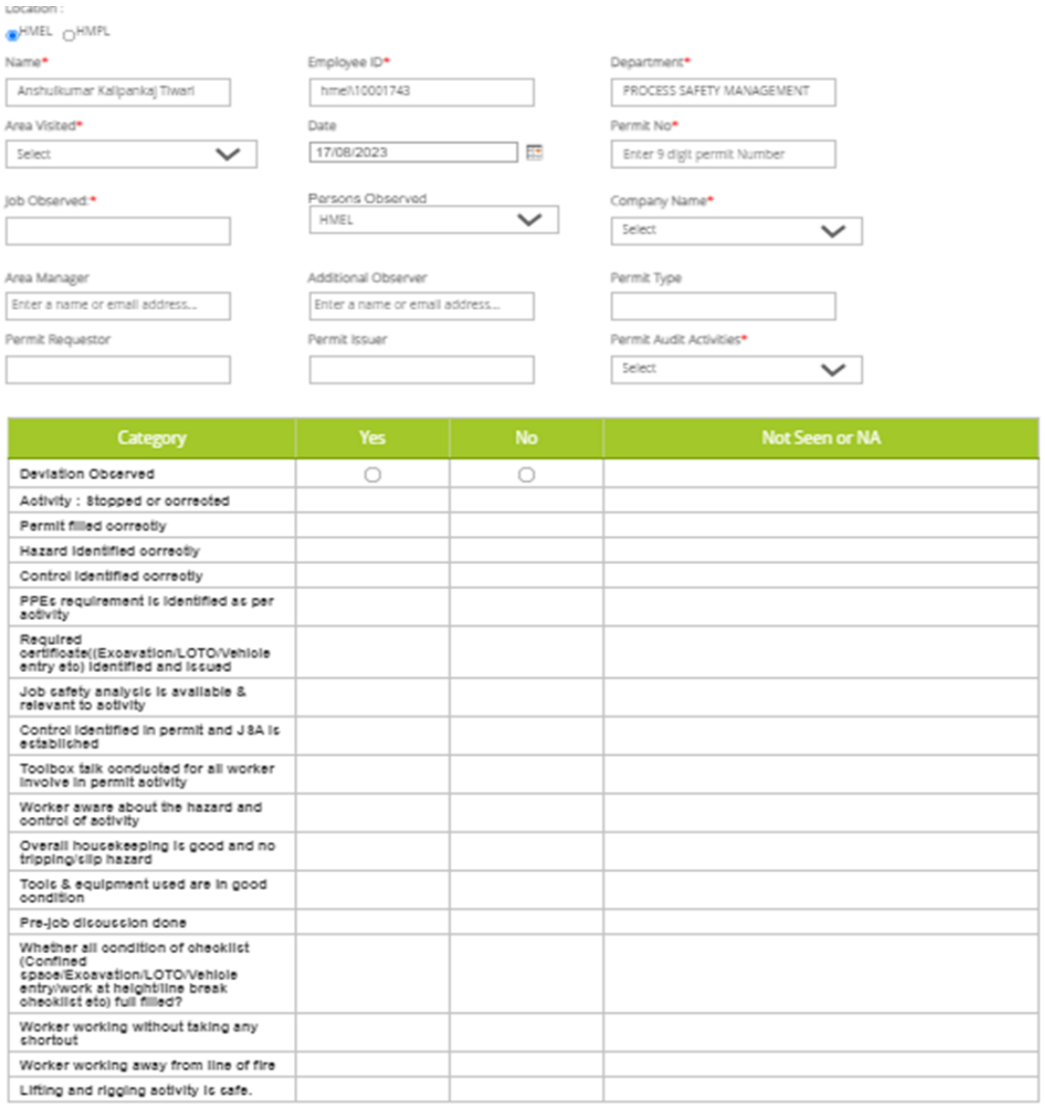
Tier 4 : Near miss, substandard condition , error producing condition that has the potential to cause loss of containment event or impact functioning of safety system

Tier 5 : Focus on conduct of operation and operation discipline: design and management system, Permit deviation, Operating discipline issues

Permit to work System in HMEL

- Robust procedure.
- E – PTW via SAP.
- Training & competency assessment of involve person.
- JSA Mandatory with all permits.
- Permit audit & Inspection by qualified safety officer.
- Critical permit sign of qualified safety engineers.

Permit audit.



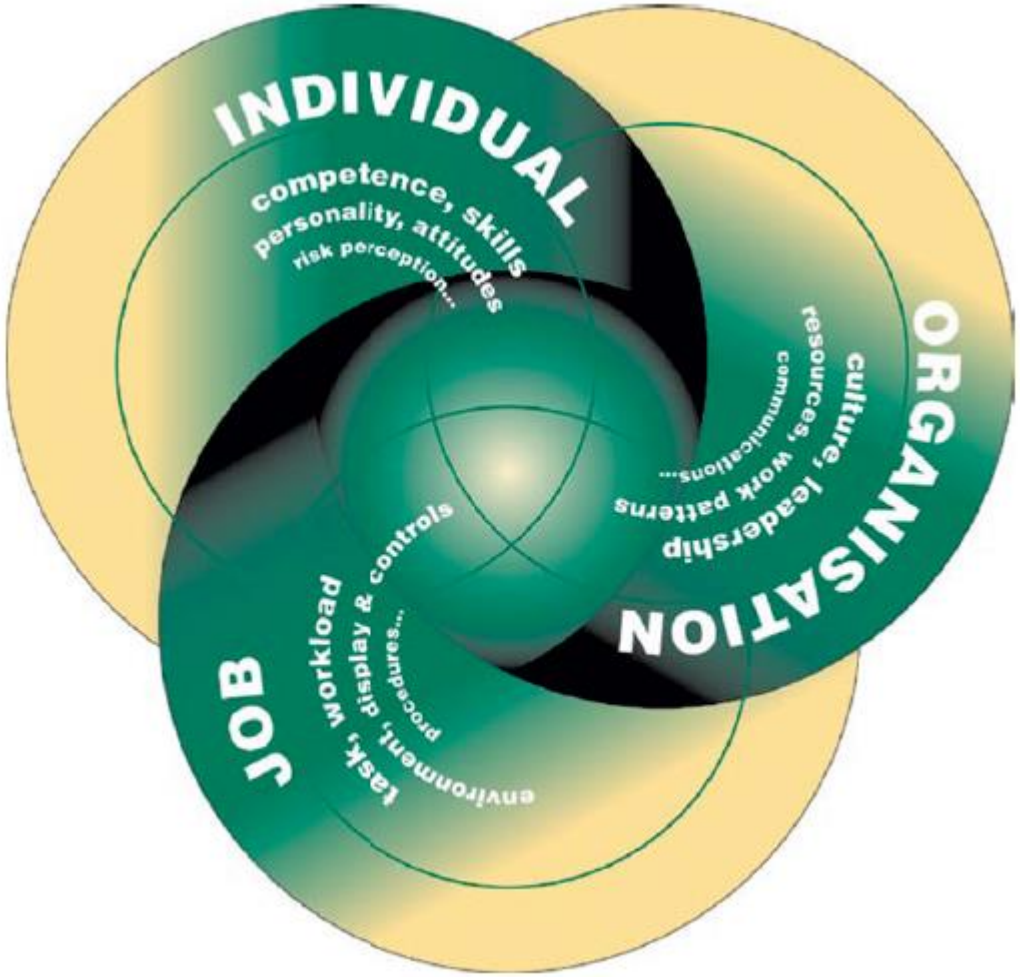
Location :
HMEL HMPL

Name* Anshulkumar Kalipankaj Tiwari
Employee ID* hmel\10001743
Department* PROCESS SAFETY MANAGEMENT
Area Visited* Select
Date 17/08/2023
Permit No* Enter 9 digit permit Number
Job Observed*
Persons Observed HMEL
Company Name* Select
Area Manager Enter a name or email address...
Additional Observer Enter a name or email address...
Permit Type
Permit Requestor
Permit Issuer
Permit Audit Activities* Select

Category	Yes	No	Not Seen or NA
Deviation Observed	○	○	
Activity : Stopped or corrected			
Permit filled correctly			
Hazard identified correctly			
Control identified correctly			
PPEs requirement is identified as per activity			
Required certificate((Excavation/LOTO/Vehicle entry etc) identified and issued			
Job safety analysis is available & relevant to activity			
Control identified in permit and JSA is established			
Toolbox talk conducted for all worker involve in permit activity			
Worker aware about the hazard and control of activity			
Overall housekeeping is good and no tripping/slip hazard			
Tools & equipment used are in good condition			
Pre-job discussion done			
Whether all condition of checklist (Confined space/Excavation/LOTO/Vehicle entry/work at height/line break checklist etc) full filled?			
Worker working without taking any shortcut			
Worker working away from line of fire			
Lifting and rigging activity is safe.			

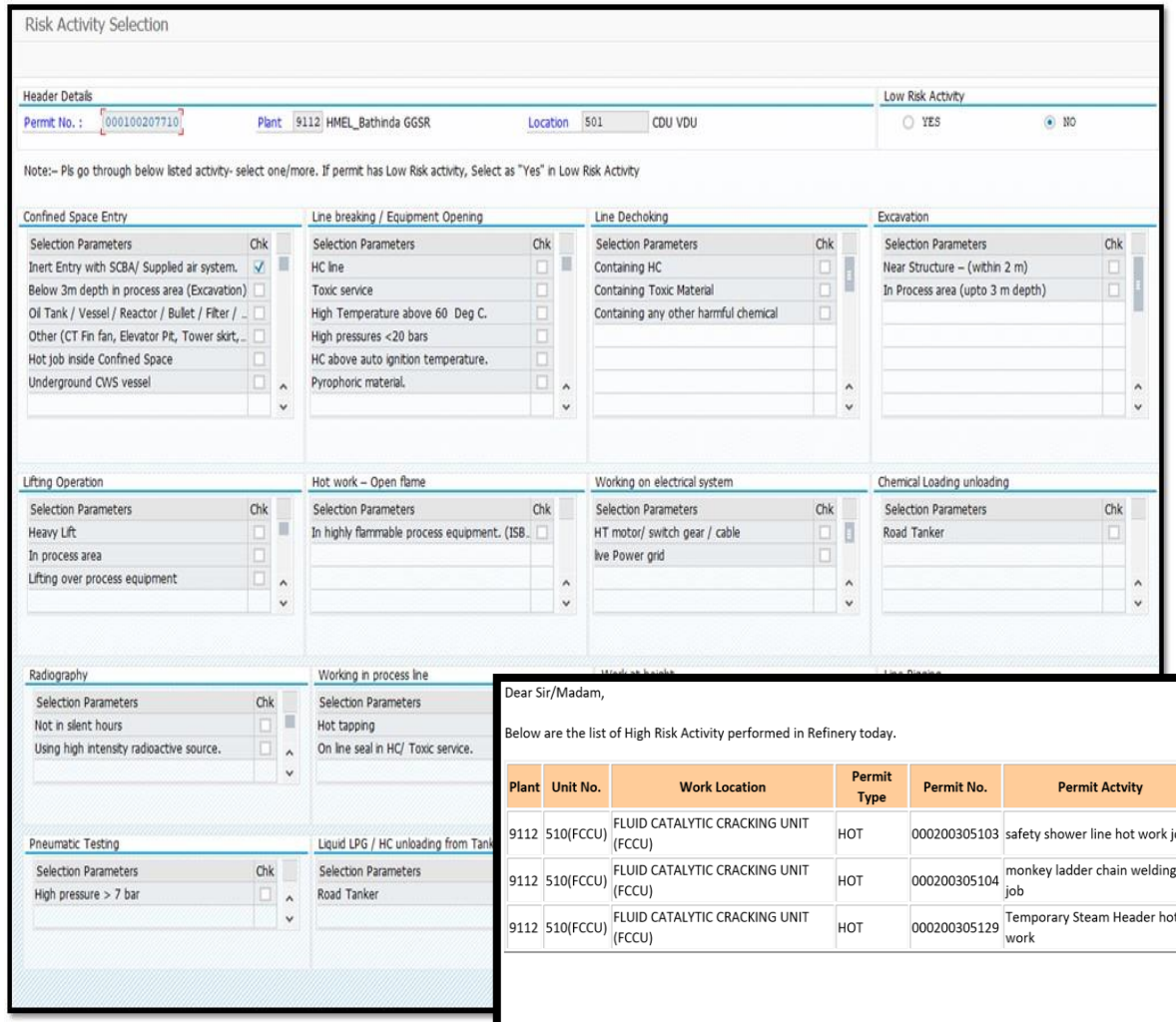
- Whether the permit information is correct? (Job/Location/Person/authorisation etc)
- Whether the Hazard & Control identified in permit is correct as per job scope.
- Whether the required document is available & adequate as per job scope. (Certificate , JSA, checklist SMP etc)
- Whether the Control identified in permit is established during the execution.

Managing permits



- High no's of permit.
- Workforce.
- Contractors Safety culture.
- Hazard identification.
  - Change activity.
  - Simultaneous activity.
- Permit work supervision.

Risk-Based Approach in Permit



Dear Sir/Madam,

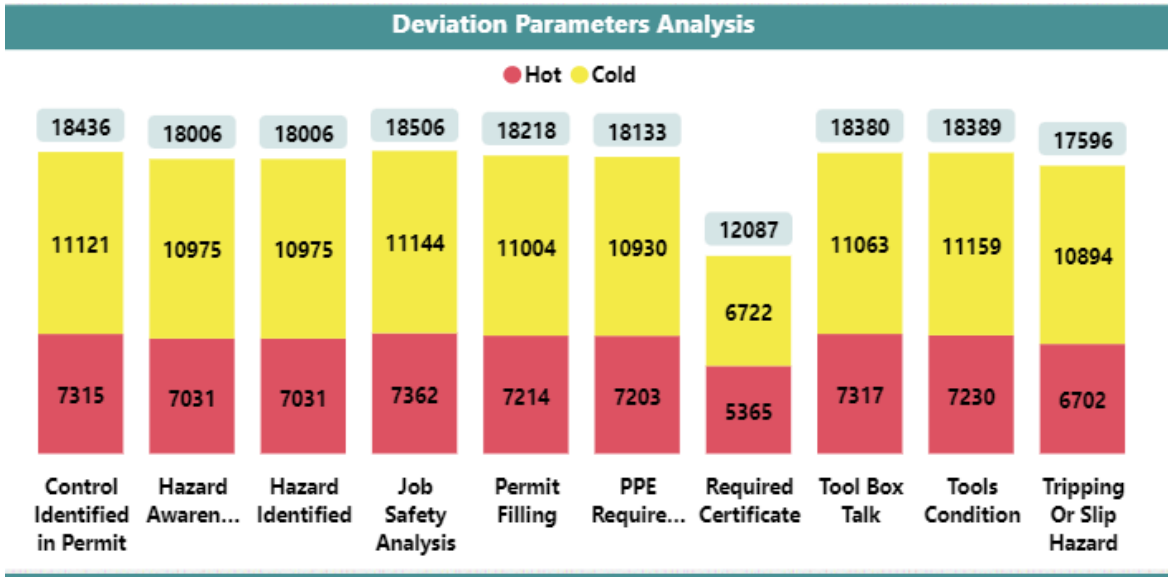
Below are the list of High Risk Activity performed in Refinery today.

Plant	Unit No.	Work Location	Permit Type	Permit No.	Permit Actvity	From Time	To Time	Risk Activity	Risk Params
9112	510(FCCU)	FLUID CATALYTIC CRACKING UNIT (FCCU)	HOT	000200305103	safety shower line hot work job	07:00:00	15:00:00	Hot work – Open flame	In highly flammable process equipment. (ISBL)
9112	510(FCCU)	FLUID CATALYTIC CRACKING UNIT (FCCU)	HOT	000200305104	monkey ladder chain welding job	07:00:00	15:00:00	Hot work – Open flame	In highly flammable process equipment. (ISBL)
9112	510(FCCU)	FLUID CATALYTIC CRACKING UNIT (FCCU)	HOT	000200305129	Temporary Steam Header hot work	07:00:00	15:00:00	Hot work – Open flame	In highly flammable process equipment. (ISBL)

Regards,
SAP – PTW system

This is a system generated mail. Please do not reply to this.

- Risk-Based Approach Integration.
  - 29 activity based on incident learning.
- Permit audit in individual's KPI.
  - 2 permit audit/person/month
  - 10% weightage.
- System based JSA for risk activity
- Critical Permit audit by leaders.



Why Deviation ?????????

What is the reason for not doing the activity in safe way (Behaviour Barrier) ?

Execution in substandard condition

- Short cut
- Line of Fire

- Personal Perception
- Mental Lapses
- Personnel Abilities
- Social Environment
- Job Planning

Behaviour Barrier	Yes	No
Personal Perception: Workers may think they don't need to follow safety precautions because (1) Their job is low-risk, (2) The precautions are uncomfortable or not practicable, (3)They don't have time to follow.	○	○
Mental Lapses : Workers may act unsafely due to (1) Forgetfulness.	○	○
Personnel Abilities: Workers are not competent for the assigned job.	○	○
Social Environment: Pressure to execute the task, Unrealistic expectations, Personnel relation.	○	○
Planning: Lack of supervision, Resources.	○	○

Focus on "People Behavior Barrier" for working in substandard condition rather then just "Permit Compliance"

Permit Audit & Suraksha Samvaad (सुरक्षा संवाद) Card (PASS)

Permit Audit

- Help in safe **EXECUTION** of permit activity.
- Help in **ANALYSIS** of permit to work parameter which require improvement at location level & organisation level
  - Permit filling
  - Documentation adequacy (JSA, Certificates, etc)
  - Actual Execution at site.
- Help management to **IDENTIFY** the pain area.
- Help Safety team & PSM – SWP element owner to **RECTIFY** or re-design the work permit program & policy.

Ensure "NO INCIDENT" during permit activity

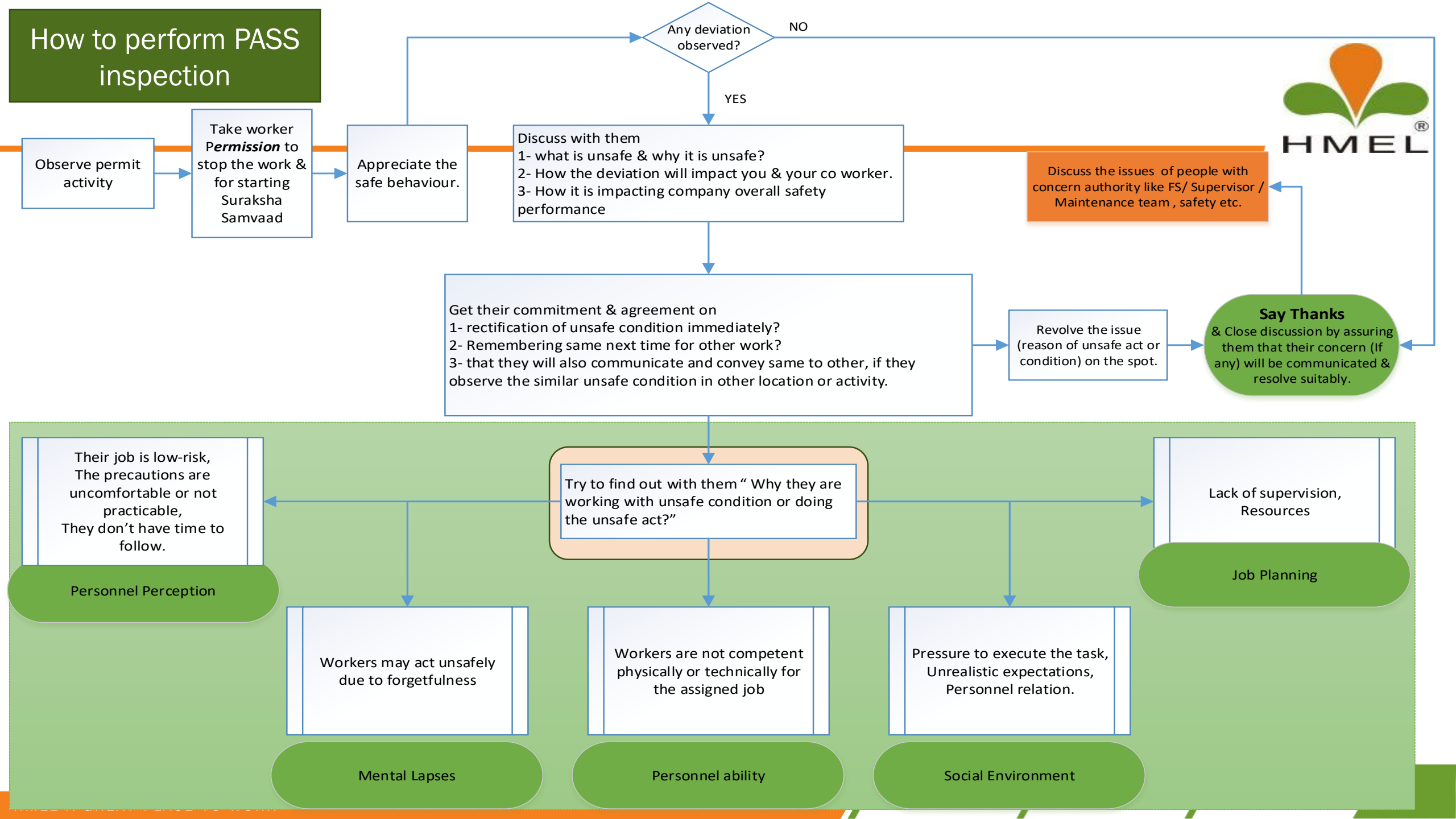
Suraksha Samvaad

- Help User in IDENTIFYING "Why people are acting unsafely?"
- Help in ANALYSES the data of behaviour barrier.
- Help in IDENTIFYING the Pain area for unsafe behaviour.
- Help Team to get the FEEDBACK on safety culture transformation initiative
- Help Team RECTIFY or re-design the culture transformation program.
- Help Organisation to ESTABLISH safety culture.

Help to improve "SAFETY CULTURE"

VISIBLE LEADERSHIP

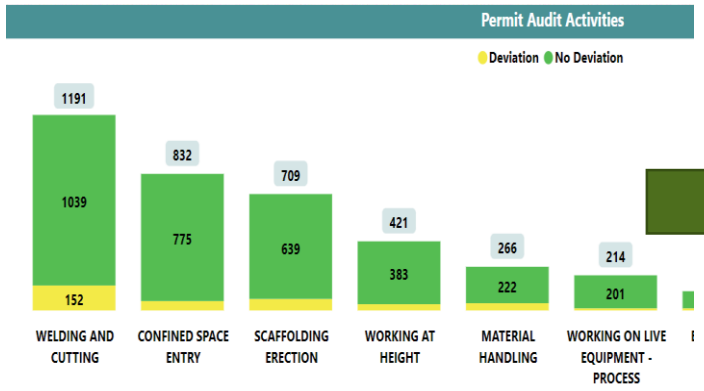
How to perform PASS inspection

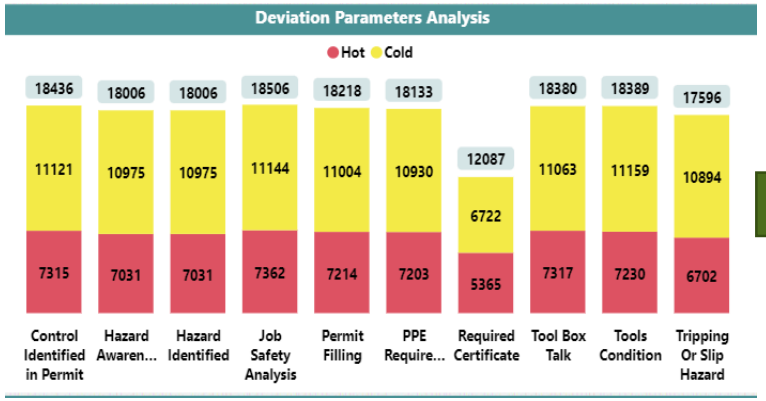


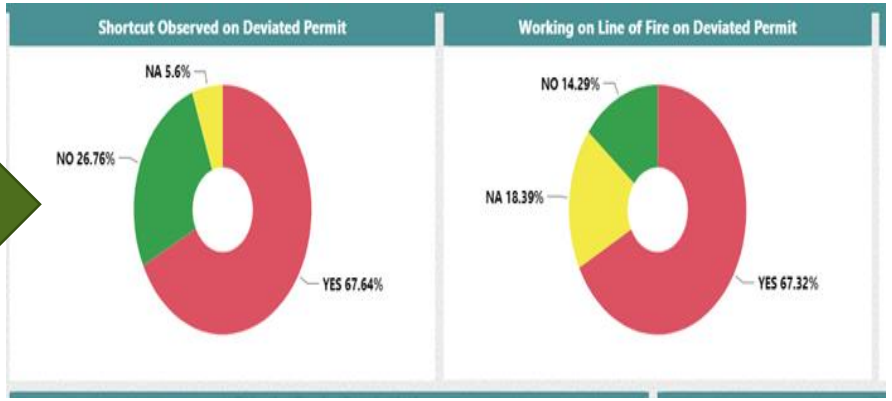
PASS - Big data analysis

- Integrating PASS portal with Analytical tool (Power BI)
- Collecting data of Permit audits & Behaviour Barriers
- Analysing the Data : Activity, Location , type of permit, Permit deviation parameter & Behaviour Barriers.
- Visualizing the data and identifying the concern.
- Comparing the data with actual incident, Conducting the root cause analysis and identifying the underlying issue.
- Developing and monitoring action plan.

Visualisation & Identification of concern





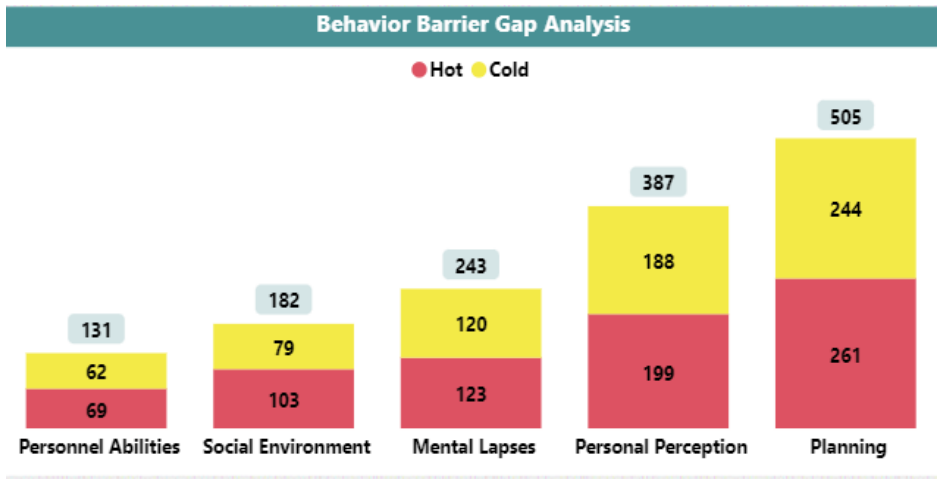


Area of improvement.

Deviation activity : Hot work activity, Confined space entry & working at height.

Deviation parameter : JSA quality, & Pre Job discussion quality,

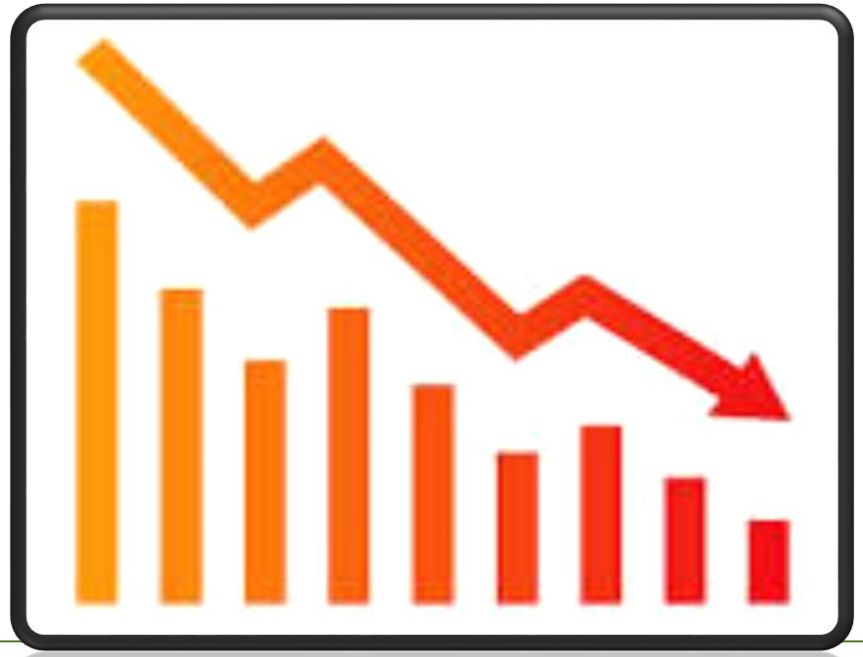
Behaviour parameter: Activity planning & Personnel risk perception.



Initiatives

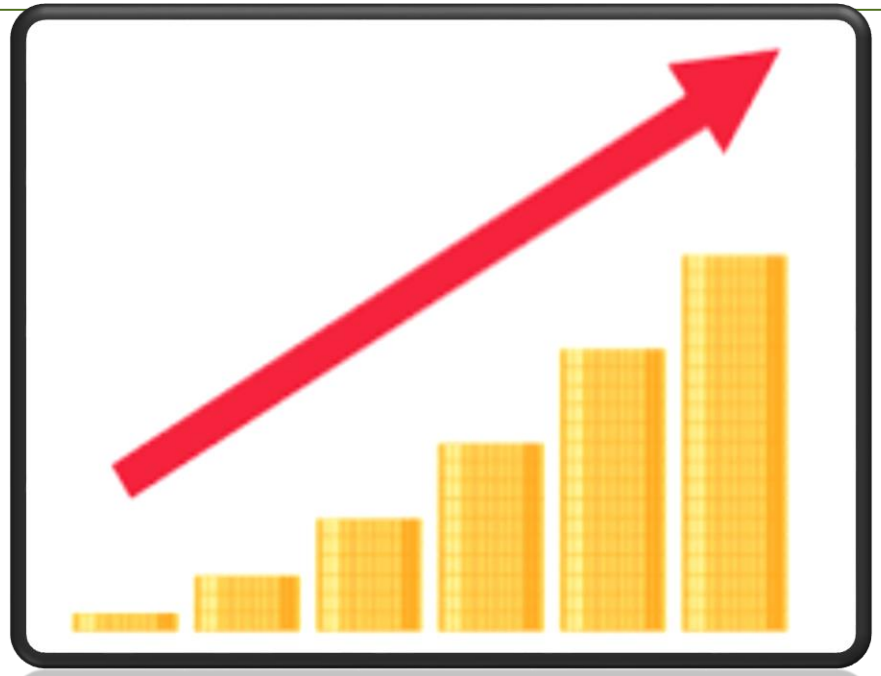
- Planning
  - 3 Day advance planning for risk activity.
  - Mandatory Involvement of contractor (Executor) in planning.
  - Mandatory field survey for High risk activity.
  - Assigning **" Safety Sponsor"** for job. (Leadership family for job monitoring).
  - Requirement of specific training for the job.....
  - Max 2 critical permit/Operator/shift.
- Risk perception :
  - Mandatory IIF supervisor & Workers workshop on risk perception.
  - STAR (Stop, Think, Act and Review).
  - Demonstration of incident in TBT.
  - Learning from incident – related with job in PJD.
  - One day Safety Officer.
  - Frequent leadership Listening tour.

Benefit



- 16% decrease in permit deviation in 12 month.
- 30% reduced in no’s of permit related accidents.

- Improved risk perception.
- Zero incident due to planning failure from last 2 year.
- Improved JSA & Pre job discussion quality.



Conclusion

- Permit deviation can emerge in operating facilities due to multifaceted factors that cannot be entirely eradicated.
- Risk based monitoring of permit activity will help in reduction in no's of actual accident.
- Big data analysis of permit deviation & behaviour barrier the are instrumental in preventing safety incidents in high risk permit activity.
- A concentrated focus on analysis of behaviour barrier enabling targeted and effective risk control methodology.
- Focus on behaviour barrier in will help in accident reduction and improved overall Safety culture of organisation.

Thank you

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