





NAMASKAR to the Delegates of CIDM 2013


HSE Measures and Disaster Management Plan at BPCL - Kochi Refinery

BPCL Kochi Refinery




ABOUT KOCHI REFINERY


- Started as Cochin Refineries Ltd, a JV between Gol and Philips Petroleum USA.
- Inaugurated in 1966 as a 2.5 MMTPA Refinery
- Through four expansions currently a 9.5 MMPTA refinery
- Product ranges include LPG, Propylene, Naphtha, MS, SK, ATF, HSD, FO, LSHS, Bitumen, specialty products like MTO, SBPS, petrochemicals like Benzene and Toluene
- Merged with Bharat Petroleum Corporation Ltd., in 2006




About Kochi Refinery ...



- The plants & infrastructure include
 - Single Point Mooring Jetty
 - Shore Tank farm.
 - Two crude distillation units.
 - Secondary units like FCCU, CCR, VBU
 - Treatment units for VGO, HSD, ATF, MS
 - Aromatic Recovery unit.
 - Storage tanks for 1.9 million KL of crude &POL and 14.6TMT LPG
 - Product dispatch terminals for road / rail / ship and pipe lines



Kochi Refinery ... IREP



- Expansion to 15.5 MMTPA refinery, Foundation stone laid by PM on 3 Jan 2013
- CDU, Petro FCCU, Delayed coker & treatment plants. Build , Own & Operate unit for H₂, N₂, SynGas
- Expected completion by December 2015.
- Total outlay Rs 14500 Crores.
- Petrochemical complex envisaged as JVs with organizations in petrochemical business / technology suppliers. Estimated investment around Rs. 6000 crores
- Highest ever single investment by BPCL / in the state of Kerala

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Kochi Refinery... 1966 to 2013 ...





23 Sept 1966



7 Jan 2013



 **Bharat Petroleum**



HSE Measures and Disaster Management Plan at Kochi Refinery





HSE Management System

- Integrated Management System accredited to ISO 9001, 14001 and 18001.
- Believes in Process safety and employee participation.
- Exceeds the requirement of legal compliance and supervision of statutory bodies.
- Commitment and involvement of top management.
- Participation by all stake holders

Management Health, Safety Security & Environment Committee (MHSSEC)

- Directs the Refinery's policies in HSE.
- All GMs, HoDs, heads of Security, Energy & Environment and OHC are members.
- The Executive Director (KR) is the Chairman and DGM (Fire & Safety) is the Secretary.
- Meets once in a month without fail.
- Analyses the safety performance, reviews progress on HSE activities and provides guidelines for improvement.

Refinery Operating System (ROS)

- **Refinery Operating System (ROS)**
 - Collection of system procedures and guidelines for carrying out operations of the refinery.
 - Ensures effective coordination of operation of the refinery business system
 - Approved by SBU Head
- **Standard Operating Procedures**
 - Operational activities at department level
- **Manuals, Handbooks, Fire Emergency Procedure, DMP**






Employees participation in safety: Safety Committees

- **Joint Health Safety Security and Environment Committee (JHSSEC)**
 - As per Section 41G of Factories Act 1948.
 - 12 elected workmen representatives and 12-management representatives at HoD level. General Manager is the Chairman
 - Meets once in two months
 - Training & Industrial tour to members
 - Best committee award by the State
- **Departmental Safety Committees (DSC)**
 - Equal participation of Workers and Managers
 - Meets once in two months.
 - Sectional level audits
- **Joint safety Committee of contractors' workmen**




PROCESS SAFETY

- **Plant layout /construction as per OISD standards**
- **HAZOP and Risk Analysis**
 - Multidisciplinary committee
 - Prerequisite for all plant changes
 - Developed as per OISD Std 178 (Management of Change)
- **Shut down Interlocks**
 - Periodic checks
 - System of approval for bypass



Process safety ..

- **Work Permit System**
 - Hot works Permit
 - Cold Work Permit
 - Electrical energisation & De-energization Permit
- **Job safety Plan for critical jobs.**
 - Multidisciplinary group
 - Hazard assessment of the activity
- **Evaluation of competency of Operating staff**



Asset Integrity Management


- In-service and shutdown inspection & testing / Schedule & history in 'Meridium'.
- Corrosion monitoring of pipelines and static equipment using latest NDT techniques.
- Corrosion control through treatment / coatings.
- On line monitoring system for the operating parameters of critical rotary equipment.
- Risk based Inspection (RBI) Programme for critical units.
- Reliability Focus group for improvement.



Enforcement of Safety


- Safety Inspection at night by senior officers.
- Safety walk by Senior Management staff.
- Contract conditions on safety performance
- Financial deterrents for erring contractors.

- Audits -- ESA, ISA & audits as per MSHIC rules




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Motivation




Kochi Refinery

- **Safety Incentive Scheme for employees:**
 - Accident free Million Manhours.
 - Sectional Safety Incentive.
 - Gifts on achieving mile stones
- **Reward scheme for near miss reporting**
- **Contractors' annual Safety Award.**
- **Safety suggestion scheme / Competitions**
- **Appreciation letters**





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Training



Kochi Refinery

- **Regular Training:**
 - New entrants
 - Refresher training.
- **Statutory training under Sec 41 C (b)Factories act:**
 - To all officers up to Manager grade.
- **Safety & Fire Training:**
 - Annual One-day safety & live fire training for employees at all levels
- **Others**
- **HSE training programme for Contractor's Employees**
 - One day workers
 - Three days supervisors
 - One day contractors/ consultants

HEALTH

- ❖ Periodic Executive Medical checkup for all employees
- ❖ Periodic Medical check up of employees in Benzene plant and high noise areas.
- ❖ Medical check up of contract workers for height working
- ❖ AMAS for community medical services




Safety Beyond workplace

- **Community awareness on safety:**
 - Safety-training programs for drivers of transporters carrying hazardous goods
 - Undertaking safety campaign in connection with National Safety Day celebration.
 - Leaflets regarding the hazards pertaining to the industry distributed to nearby residents.
 - Safety awareness programmes for the residents around the Refinery premises.
- **Off the job Accident monitoring:**
 - Centralized system of monitoring off the job accidents of employees.
 - Discussed in the Central Safety Committee.
 - Counseling of employees is also being conducted on a case-to-case basis.





Disaster Management Plan


Disaster Management plan: Statutory requirements

- Section 41 B The Factory Act 1948 / MAH Rules
- Rule 13 and Schedule 11 of MSIHC Rules
- PNGRB Regulation
- District level off site emergency Plan
- OISD std 116 & 117



PNGRB Guidelines, Clause 6 : Classification of emergencies

- Level -1: Minor Emergency - plant level
- Level -2: Major Emergency - potential cause injury/fatality /damage
- Level -3 a. : Disaster : On-site
 - Affects one or more plants with serious potential to cause damage to personnel/property and environment. Help from external sources such as Mutual Aid Members.
- Level -3 b. Disaster : Off-site
 - Incidents involving large-scale injury, death or damage beyond own resources / mutual aid & threatening civilian population.
 - Off-site Emergency Plan prepared by District Authority.






Mock drill requirement

- OISD 116 & 117
FIRE EMERGENCY PROCEDURE
 - Fire emergency procedure manual
 - Fire fighting plan for fires in process units, in and around tanks, in the LPG storage etc.
 Mock drill
 - Once in a month
- Mock drill of ERDMP
 - Level 3a / OEP - Once in six months
 - Level 3B / Offsite DMP - Once in a year

BPCL KR ERDMP functionalities

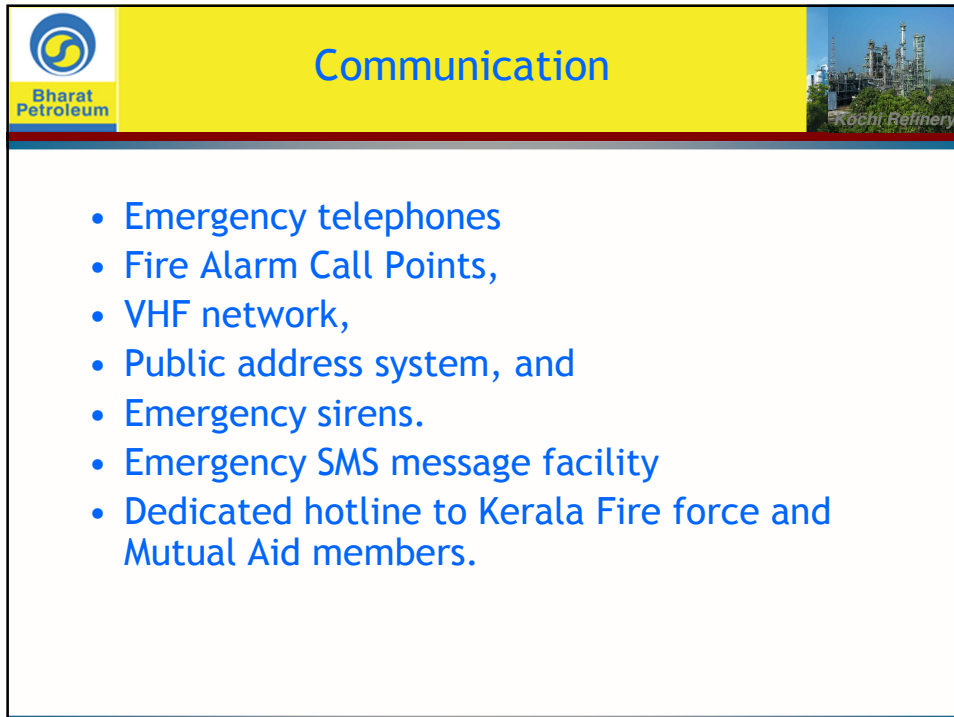
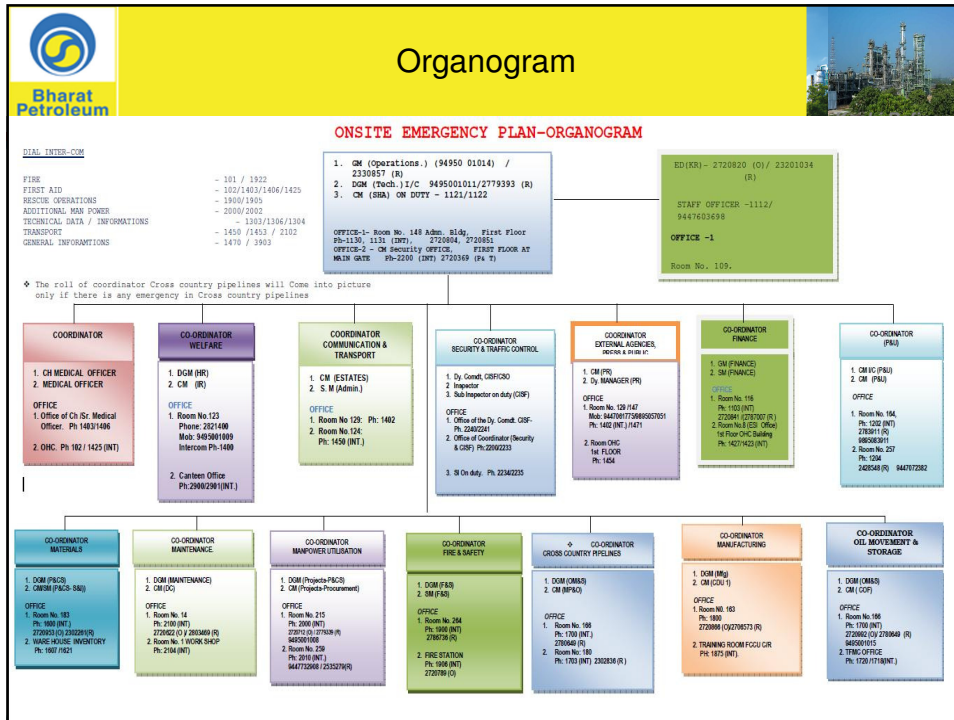
- **Chief Incident Controller (CIC) : General Manager (Operations)**
 - Enforces On-Site Emergency Plan / Withdrawal of On-Site Emergency Plan.
 - Ensures that procedures laid out for On-Site Emergency Management Plan are strictly followed.
 - Review and monitor of the situation and take corrective action with the help of functional coordinators / external agencies.
 - Ensures the functioning of Emergency Control Centre
- Arranges for chronological record of the emergency.

BPCL KR ERDMP Functionaries ..

- **Site Incident Controller (SIC)**
 - The head of dept. in whose area the disaster has struck
 - Chief Manager-Shift Administration.

DGM (F&S) will act as Fire Adviser.







Mutual Aid



- Mutual Aid Plan at Refinery:
 - Fertilizers and Chemicals Travancore Ltd (CD)
 - Hindustan Organic Chemicals Ltd (HOCL)
- Mutual Aid Plan at STF
 - Petronet LNG Ltd
 - FACT (Udyogamandal)



Fire protection Systems




Detection Systems


- Gas Monitors: HC, H2S, H2
- Smoke detectors
- Fire detectors

Firewater Network:
Pressurized , 60 KM net work,
with hydrants and monitors,


HVLR Foam monitors

Automatic fire detection & Protection in EFRFTs, LPG spheres





Fire Protection System



- **Clean agent based automatic fire protection system in control rooms / SRR:**
 - Novec 32 / Argonite / NAF SIII

- **Rescue equipment**
 - Pneumatic lifting bags, Hydraulic cutters, Leak sealing pads
 - Gas tight chemical suits, Tripod with automatic retractable winches, Fire proximity suits etc.

- **Fire Tenders / Equipment - mobile & portable.**
Foam, DCP, CO₂



Fire Training Ground







Bharat Petroleum **Hazardous Material Leak Arresting** *Kochi Refinery*

<p>Collection Container</p>	<p>Leak Sealing Bags</p>	<p>Leak Sealing Lance</p>
<p>Leak Sealing Bandages</p>	<p>High Pressure</p>	<p>Lifting Bags</p>

