Indian Farmers Fertilizer Cooperative Limited

Kalol Unit, District: Gandhinagar, Gujarat

(Platinum Award – Highest performance for Award year 2023 and Gold Winner consecutively for the Award years 2021 & 2022)

D. G. Inamdar (Director, Kalol and Nano Fertilizer) and **Rajnikant Sharma** (Dy. General Manager, Fire & Safety)

A Journey Towards Excellence in SHE Management

Fertilizer plants manufacturing Ammonia & Urea are amongst the most complex and hazardous plants in Chemical industry. Manufacture of anhydrous liquid ammonia and Urea involves processing of hydrocarbons under high temperature, high-pressure conditions in presence of various catalysts, chemicals, etc. All this has the potential to severely affect the safety of equipment, personnel involved and the environment. Recognizing this, IFFCO-Kalol is continuously putting efforts for improvement in the Safety of plants and personnel. Right from Project conceptualization stage, safety and reliability have been considered the principal criterion for evaluation of technologies for various process plants. Plants are well designed and built incorporating all inbuilt process safety measures to the highest standards.

1. Background of the Factory

IFFCO Kalol is the oldest unit of IFFCO. Ammonia - Urea Complex at Kalol was installed and commissioned in the year 1974. The unit built over an area of 96 hectares, started commercial production in April 1975. The ammonia plant is a Natural gas-based plant of 1970's vintage and Urea Plant is based on M/s Stamicarbon Technology. IFFCO Kalol Unit is presently producing about 1650 MTPD of Urea and 1100 MTPD of Ammonia. IFFCO has also established Nano Fertiliser Plant at its premises for the production of Nano Urea and Nano DAP liquid fertiliser.

IFFCO Kalol Unit has established and implemented Integrated Management System (IMS) consisting of Environment Management System (ISO 14001: 2015), Occupational Health & Safety Management System (ISO 45001:2018) and Quality Management System (ISO 9001: 2015). IFFCO - Kalol unit is also certified with ISO 50001:2015 (Energy Management System) and IFA protect and sustain Product Stewardship certification.

2. Commitment of Top Management Towards SHE

The safety philosophy and commitment are spelt out in our SHE policy at corporate level as well as unit level. SHE policy is duly issued by the Managing Director at corporate level and by the Occupier at unit level. IFFCO Kalol is committed to provide a Healthy and Safe working Environment to all the employees, contractors, visitors & other stakeholders.

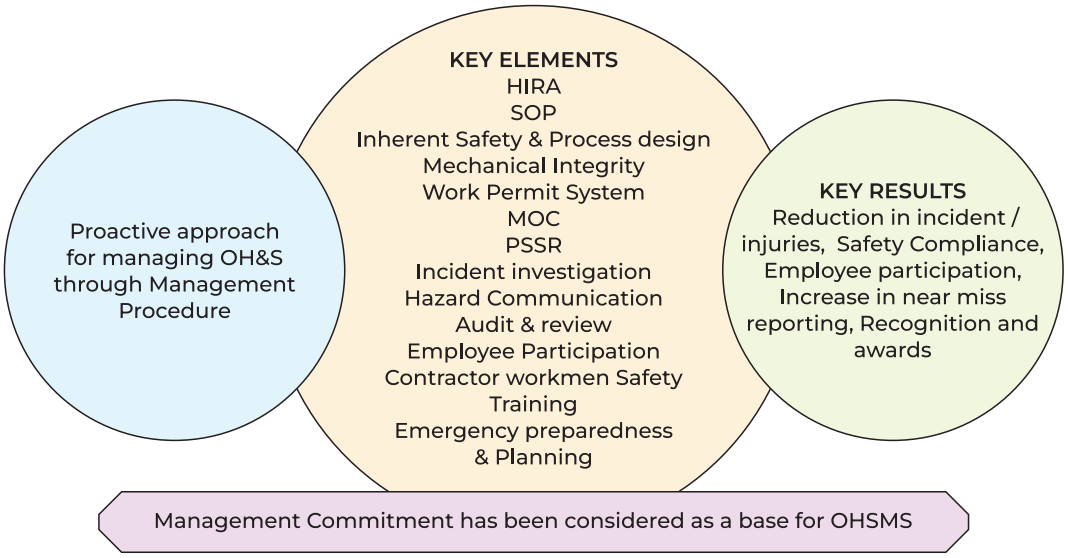
At IFFCO Kalol unit, Occupational health and safety is treated as an integral part of our business activity. Management believes that Safety is not a priority, it's a core value.

- IFFCO Kalol is committed to continual improvement of OH&S Management System, and to meet the OH&S legal and other requirements.
- Safety, health and environment protection are direct responsibilities of management and employees at all levels and those are considered collectively as one of the measures for their career development.
- IFFCO management has always been committed to implement & maintain best in class safety systems and procedures.
- IFFCO management is highly focused on providing world class & quality safety equipments and PPEs. Budget is not any constraint for safety.
- IFFCO management considers Safety training, a very important tool for maintaining safe work environment at workplace and strives to provide all the required resources for imparting safety training to each and every employee and contract workers.
- In all business decisions due care is paid to optimize consumption of resources and minimize generation of waste.
- Safety performance of the unit is discussed monthly and quarterly in the safety committee meetings and quarterly review meeting at management level.
- A resume of Health and Safety performance occupies an important place in the Annual Report of the company for information of all concerned.

3. SHE Management, its Linkages with Key Result Areas and Outcomes

IFFCO Kalol unit has established and implemented Safety management system based on a proactive systematic approach for improving and managing safety through management procedures. Emphasis is given on controlling the hazards by applying the hazard control hierarchy of **Avoid, Prevent and Mitigate**. The methodology is based on PDCA approach for continual improvement in overall safety performance of the unit.

Various elements of SHE management system are shown in the following pictogram:



Some of the elements of SHE management system at IFFCO Kalol Unit are discussed here briefly:

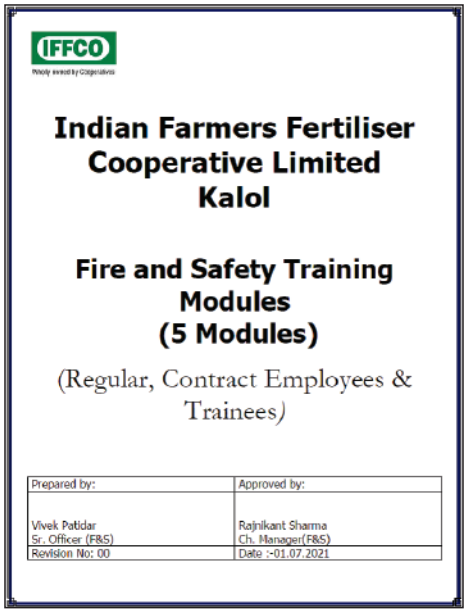
- **Hazard identification, frequency estimation**, consequence analysis, facility siting evaluation, inherently safer process evaluation and risk analysis have been carried out by using advanced software and techniques such as Hazop Study, Failure mode & effects analysis, Fault tree analysis, event tree analysis, quantitative risk assessment etc. In addition to that audit, Inspections, Incident investigation, Case studies, Job safety analysis, Hazard spotting etc. are used to identify hazards, assess risks and implementation of control measures.
- All the pressure vessels/pipe lines are provided with Safety Relief Valves, Audio-Visual alarms, trips and Safety interlocks.
- **Safe Operating Procedures**

  Safety Manual, Safe working methods & procedures, Safety rules, Safety Policy, Safety work permit procedure, tagging procedures, Do's and Don'ts of hazardous jobs, start up and shutdown procedure Emergency Shutdown Procedures etc. have been formulated and propagated among the employees to eliminate any unsafe act and the same are reviewed periodically.
- **Mechanical Integrity & Quality Assurance**

  The mechanical integrity of the equipments and pipelines is ensured by annual inspection, non-destructive testing and preventive /predictive maintenance. The Unit has computerized master preventive schedule list for the same. Continuous monitoring of vessels and running equipments is being done using various condition monitoring methods and different types of non-destructive testing. Overhauling of equipment & Hydro-testing of pressure vessels, Thickness measurement of pipelines and vessels, Hardness measurement (Metal & Rubber), Spark testing of rubber lined pipelines and vessels, DP Test and Radiographic testing of joints and tapping, metallography to check defects in microstructure, boroscopy of tubes for detecting defects, Ultrasonic thickness measurement, etc. are being carried out at periodic intervals. Various actuators, MOVs, RV, Control valves and interlocks are checked for proper functioning during annual turnaround.
- **Safety Work Permit System**

  Safety work permit system (for hot work, cold work, vessel entry, work at height, electrical work etc.) and safe operating procedures are strictly implemented to provide safe working environment during the maintenance and any plant job.
- **Management of Change**

  Management of Change committee is constituted for management of all modifications to process chemicals, technology, equipment, facilities, and process conditions or any changes within the documented technology.
- **Safety Training Modules**


IFFCO

Indian Farmers Fertiliser Cooperative Limited Kalol

Fire and Safety Training Modules (5 Modules)

(Regular, Contract Employees & Trainees)

Prepared by:	Approved by:
Vivek Patidar Sr. Officer (F&S)	Rajnikant Sharma Ch. Manager(F&S)
Revision No: 00	Date :-01.07.2021

Safety training modules have been prepared for Employees, Contract workmen including security staff, IFFCO trainees including Graduate Engineer Trainees, apprentice trainees, vocational trainees and Visitors.

- **Contractor Safety Management**

SHE system and procedures of the contractors are reviewed, and only reputed and experienced contractors are awarded the job. All the contractor staff are imparted safety induction training prior to their deployment at work site. Various job specific PPEs are issued to all the contractors on returnable basis by F&S department. Tool box talk or job specific trainings are also imparted to the contractor staff at worksite.

- **Incident Investigation**

To prevent the reoccurrence of any incident, it is necessary to know exactly how and why incident occurred. All level of employees are made responsible for prompt reporting of any incident and all near misses / accidents / first aid cases are investigated by plant supervisor / plant in-charge / Special nominated committee; as per the severity of the incident.

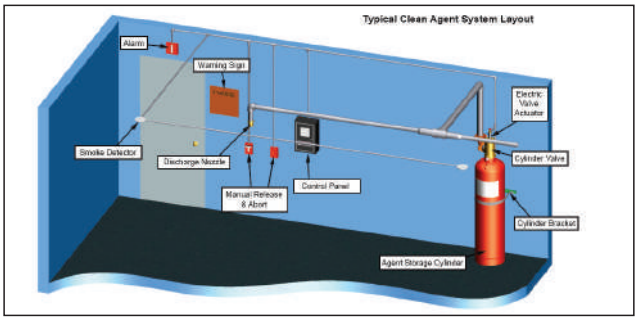
- **Personal Protective Equipments**

Quality PPEs (Respiratory and Non respiratory) confirming to relevant National/ International standards for head-to-toe protection have been made available and use of required PPEs is ensured.

- **On-site Emergency Plan**

Onsite emergency plan has been prepared for the factory. Emergency mock drills are conducted as per plan. Offsite mock drills are conducted in collaboration with District crisis group (DCG). Emergency mock drills are also conducted with NDRF battalion stationed at Gandhinagar.

- **Novec Automatic Fire Suppression System** has been installed at IT Server room and Plant telephone exchange.



- **Colour Coding of Pipelines**

4. Statutory Compliance and Implementation of the Recommendations of Studies, Audits, Committees, etc.

IFFCO Kalol is IMS (ISO-9001, ISO-14001 & ISO-45001) certified company and committed to meet the OH&S legal and other requirements beyond statutes also. Compliance of the safety provisions under various statutes such as, Factories Act, MSIHC Rules, Environment Protection Act, Indian Electricity Rules, Static and Mobile Pressure Vessels Rules, Petroleum Rules, Indian Boiler Regulations etc. is done on top priority. External safety audit is carried out as per statutory requirement. Internal safety audit and

visual inspection of plant is carried out by management level committee. IMS Internal audits, surveillance audits and recertification audits are carried out as per their schedule. QRA study, HAZOP study, HAC etc. is also carried out as per requirement. Compliance of the recommendations of all such studies, audits, safety committee and various other committees is strictly ensured within stipulated time interval and a copy of these reports and compliance status are submitted to concerned statutory bodies too.

5. Employees Participation and Involvement in SHE Matters

Involvement of the employees in SHE matters plays a crucial role in improving the safety culture. At IFFCO Kalol, different schemes/ measures have been implemented to increase the participation from the employees and workers in enhancing the safety of the plant.

- **Safety Committee**

  Safety committee is constituted to ensure participation of the employees of management and worker level in safety management and to strengthen the safety culture in the organization.

  Through **Shop Floor Safety Committee Meetings** participation of all levels of employees in safety management is ensured. It raises the safety consciousness among all cadres of Employees who are directly involved in operation & maintenance of equipments at shop floor.

- **Safety Campaign**

  National Safety Week, Road safety week/month, Electrical Safety week, Environment week are celebrated, and **National Fire Service week** is observed every year with a goal to create awareness among the employees and workers regarding safe work practices and working environment.

Various competitions like **Safety Slogan, Safety Poster, Safety Essay, safety Quiz, fire drill etc.** are organized for different groups of employees and their family members. All the winners and the runners are awarded with fabulous prizes.

- **Online Suggestion Scheme**

Online suggestion scheme is established to motivate employees to come out with creative thinking and noble ideas. The purpose of this scheme is to improve safety, productivity, quality and environment. All the suggesters are motivated through cash prizes. Best suggestions are rewarded and recognized by the management.

- **Good House Keeping Competition**

  Through good housekeeping competition, all the sections participate in making their workplace clean and tidy thereby preventing fires and incidents caused due to poor housekeeping. Winner sections are awarded with fabulous prizes.

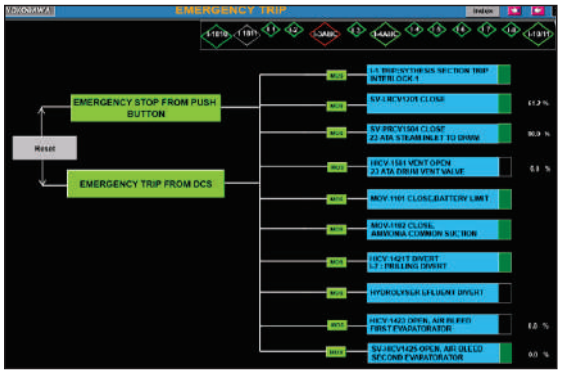
- Employees are also involved in the preparation of SOPs and investigation of incidents.

6. Special Efforts for SHE

6.1 Process Safety Initiatives:

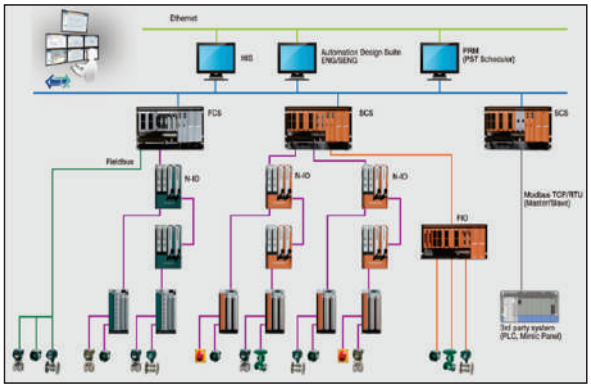
- **Single Push Button Emergency Trip System to Trip Complete Urea Plant**
- An emergency stop switch is a safety mechanism used to shut off plant machinery in an emergency when it cannot be shut down in the usual manner.

- Earlier operators had to operate different logics to stop all plant sections separately, to shut down the complete plant in emergency situation.
- The trip logic has been so developed that in case of any abnormality/emergency only one push button shall be operated through DCS and sequential safe shut down of the plant can be achieved in very short time without asking the operational staff to go to field for manual shut down operation thereby exposing them to hazardous situation/chemicals.



- **ESDS (Emergency Shut Down System)**

ESD (Emergency Shut Down System) has been installed to manage and control the start and stop sequences of a plant or machine in order to achieve safe shutdown of the plant in case of any abnormal/emergency /event to protect man , machine and environment. The major purpose of an ESD system is to keep the process in a safe state in case the predetermined setpoints have been exceeded or in case the process goes beyond the safe operating conditions. In this situation the ESD system will come in line and based on pre-configured cause and effect diagram, **shut down the plant or process in a safe manner**. The ESD is composed of safety functions with sensors, logic solvers and actuators. Action of ESD is very fast and it acts in milli seconds. The ESD first read sensors, do the calculation and logic which is required to determine the dangerous conditions, generates the output for the final control element to prevent the hazardous situations. Implementation of this safety feature has enhanced man and machinery safety significantly.



Time Synchronization between control system, Emergency shutdown system and system-1 (rotary Machine vibration analysis system)

In IFFCO Kalol urea complex, Time synchronization between all plant control systems(DCS), safety systems(ESD) and rotary Machine analysis systems (System-1) is being achieved through GPS master clock.

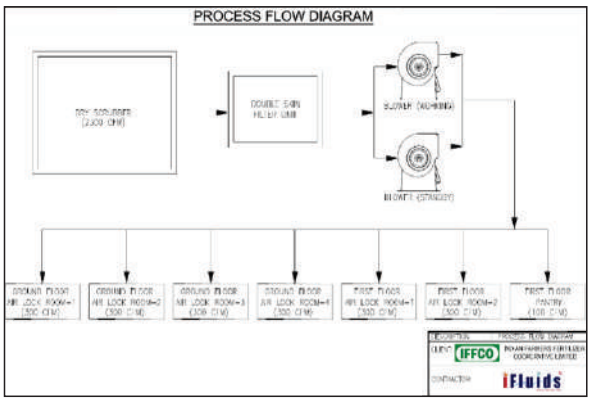
Time synchronization/ matching plays vital role in fault finding, event analysis and match time between systems which are connected to it. This enables to establish actual sequence of events in interlinked systems to facilitate for root cause analysis.

- **Close Circuit Ammonia Drainage System**

Closed drain system has been provided for draining of carbamate solution, Liquid ammonia and Urea Solution in Urea plant. Carbamate solution and Liquid ammonia from carbamate and ammonia pump and Urea Solution from Urea solution pump and Urea solution filters are drained through closed loop and collected in Wastewater tank from where ammonia is recovered through hydrolyser and no ammonia is released in plant drain system.

- **Control Room Pressurization and Ammonia Neutralization System**

A Pressurization and ammonia neutralization system has been installed in the Urea Control room. The pressurization system is designed to maintain a positive air pressure in the airlock rooms to prevent the ingress of contaminants or hazardous gases from entering or spreading into the control room thereby ensuring the safety of the personnel inside the room in case of any toxic gas leakage or other emergencies. The dry scrubber has also been installed for Ammonia neutralization to mitigate the harmful effects of ammonia, by neutralizing it. The ammonia free air enters the airlock lobby. The dry scrubber-based ammonia neutralization system is first and unique in its nature.



- **Installation of Centrifugal Pump for Ammonia Transfer to Ensure Life Safety and Process Safety**

  In most of the fertilizer units including ours; reciprocating ammonia supply pump is used for supply of liquid ammonia at very high pressure as per process requirement.

  The use and operation of such pumps are associated with the risk of damage /breakdown of plungers, barrels, tie-rods, manifold valves, end covers etc. This may result in heavy release of ammonia into the atmosphere causing exposure and adverse health effects to persons & the environment.

  Several such incidents involving damage/breakage of these type of pumps have already taken place in similar industries worldwide; causing severe ammonia leakage and exposure.

  Considering the safety of persons by avoiding such incidents', reciprocating pump is being replaced by Centrifugal pump in urea plant for high pressure ammonia supply to meet process requirements even at high cost of investment. The cost of this project is around 40 Crores.

- **Common Header for Rv's**

  All the RVs (Ammonia System, Carbamate System) are not directly discharging to atmosphere. RV Discharge are connected to common vent header which is connected to vent stack at a suitable safer height. Through vent stack, gases and vapours are discharged to atmosphere and liquid is collected in Ammoniacal Water Tank.

- **MOV for Ammonia Pump**

  Motor operated valve has been installed in the suction line of hot ammonia pump at Ammonia plant to ensure effective isolation by closing the valve remotely in case of any emergent situation.

- **Sop Register**

  Various SOPs related to process safety of the plant have been prepared and updated as and when any modification takes place in the process. SOP is discussed and reviewed with the field staff and experienced workforce and updating/revision details are entered in SOP register.

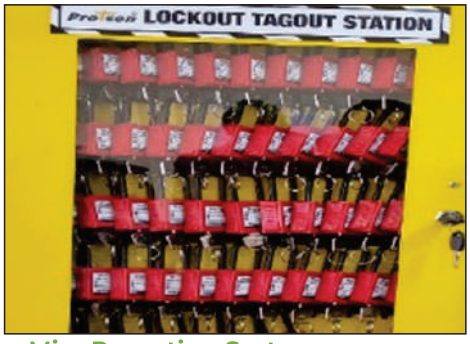
6.2 Other Initiatives: -

- **Ammonia Storage Tank Safety And Layers Of Protection)**

  Ammonia storage tanks are double integrity cup-in-tank, comprising of an inner cup and an outer tank. The outer tank is designed for full containment of ammonia vapours and liquid in the event of failure of inner tank. The tanks are provided with insulation to avoid heat transfer. Excessive Ammonia vapours are transferred to ammonia plant with the help of refrigeration compressor. Flare stack is provided for burning excessive vapors. The instrumentation (alarms & interlock) system, pressure relief valves, vacuum relief valves for tank safety are provided as per good engineering practice, standards & codes.

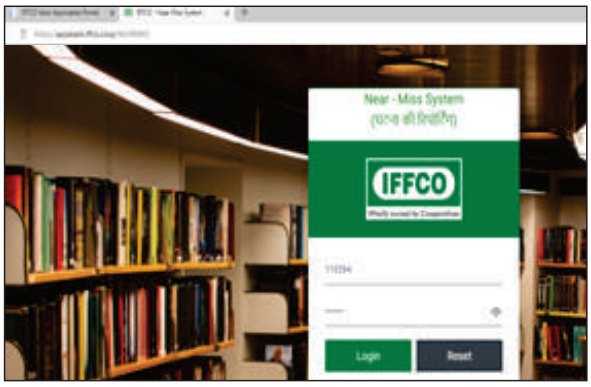
- **Lock Out and Tag Out (LOTO) Station**

  Lock Out and Tag Out procedure has been established for Isolation of energized equipments/ machineries.



- **Online Near Miss Reporting System**

  Any unsafe condition, near miss incident, and unsafe act can be reported by means of this system. Mobile app is also developed for the same and can be used by all employees.



- **Induction Training & Toolbox Talk**

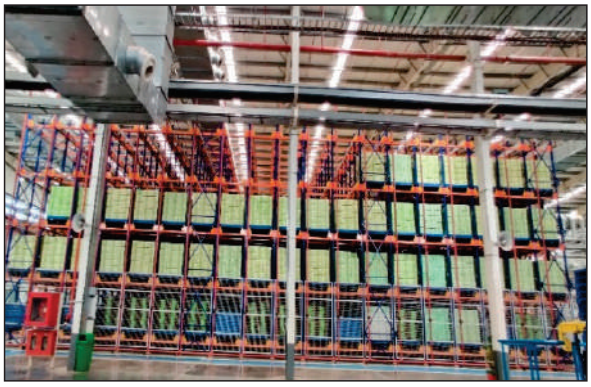
  Induction training is given to Contract workmen before allowing them to start job at plant site and periodically safety meetings/ safety talk/ toolbox talk is arranged with contract workmen on various safety aspects.

- **Safety Exhibition & Safety Park**

  Safety Exhibition at Safety department and Safety Park at construction site to display various safety equipments, procedures and PPEs along with methods for their use. This helps in improving the effectiveness of training and learning.

- **Sprinkler System**

  Remotely operated sprinkler system has been installed at Ammonia loading pumps, Ammonia loading gantry (rail & road) at ammonia storage area, ammonia & Carbamate pumps in Urea plant for neutralization and dilution of ammonia vapour in case of any leakage thereby controlling its spread. Automatic sprinkler system has been installed for the protection of Automated Storage & Retrieval System (ASRS).



- **Hazardous Installation Audit Committee**

  A management level Visual Inspection committee is setup which carries out quarterly Inspection of hazardous installations.

- **"Diphoterine" for Chemical Burns**

  Diphoterine solution has been made available at all control rooms. It is an emergency rinsing substance which is capable of reacting with both acids and alkalis when applied to either type of chemical spill, stopping the aggressive action of a corrosive or irritant chemical, halting the reaction with the skin and eyes thereby reducing the severity of burn and recovery time significantly. It is effective against a wide range of classes of chemical products (acids, alkalis, oxidizing agents, reducing agents, alkylating or chelating agents and solvents).

- **Emergency Escape Hood**

  Escape hood for escape in case of any toxic release (Ammonia, HCl, H2SO4, SO2 etc.) has been made available at strategic locations. It can be very easily used for escape in case of emergency.

- **Environment Management System**

  IFFCO Kalol has adopted the following approaches and innovative measures to improve the environment.

  - Installation of Vibro Priller at prill tower top in urea plant to reduce product temperature and dust emission.
  - Reduction in gaseous emission by recovery from vent gases.
  - Minimize the use of raw water by recycle and re-use of the process condensate / water.
  - Rainwater harvesting modules of approx. 25m3 capacity have been installed at various locations in factory and township premises.

  - Replacement of High Energy Consuming Ballast, Lamps etc. with energy efficient Compact Fluorescent Lamps (CFL), LED lighting fixtures have been carried out at plant and township.
  - Green belt development by more & more tree plantation.
  - Environmental related parameters such as pH, flow and ammoniacal nitrogen are monitored on line and data is transmitted to servers installed at SPCB as well as CPCB.
  - IFFCO Kalol unit has installed a Solar Photovoltaic system of 995.26 kWp capacity at roof top of various buildings at plant and township area.
  - Continuous Ambient Air Quality Monitoring station (CAAQMS) has been installed near Plant main gate and commissioned for monitoring of PM10, PM 2.5, SOx, NOx, and Ammonia in the ambient air.

- **Occupational Health Management**

  - IFFCO Kalol unit has a well-equipped and full-fledged Occupational Health Centre with sufficient staff and ambulance.
  - Preemployment medical examinations are conducted.
  - Elaborative full body checkup of all employees above the age of 45 years is carried out in multi-specialty hospitals.
  - All the employees under 45 years are medically examined by our medical officer once in year at our occupational health center.
  - All the employees and contract workmen working in hazardous areas, defined as per Act,

undergo the entire medical test once in 6 months.

- Audiometry of employees those who are working in high noise area is done at every six months.
- First aid boxes have been made available at all plant areas.
- Proper collection and disposal of Bio-medical waste generated at plant and township Occupational health Centre (OHC)

- **Scaffolder Training**

A 4-day scaffolding training program has been organized for a group of employees. They have received a training certificate from Scaffolding Training Institute, USA and are recognized as "Competent person/inspector".

Apart from this, following systems are also practiced/established:

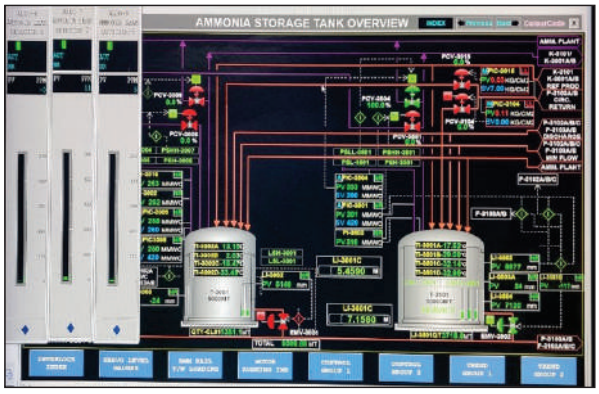
- At construction sites boom lifter, Scissor lift and mobile working platforms are used for performing any job at height. This is safer method and eliminates the use of scaffolding which results in prevention of incidents due to fall from height.
- Kalol unit has mutual aid agreement with neighboring industries such as ONGC and GAIL.
- Kalol Unit has NABL accredited lab for the analysis of relevant parameters in relation to Safety, Health and Environment.
- Safety showers with eye wash unit have been installed at strategic locations all over the plant area.

7. Use of Advanced Digital Technology to Enhance Safety

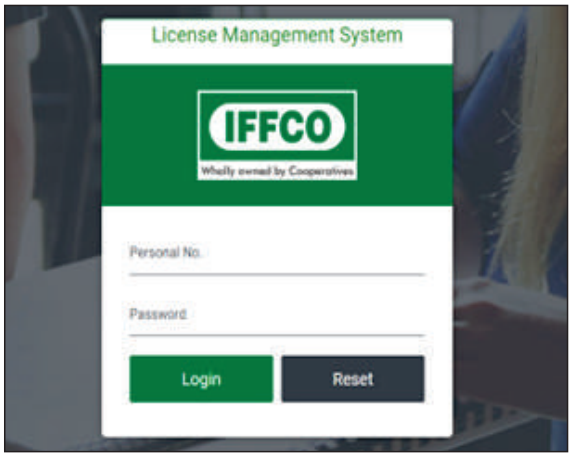
There has been a rapid increase in the use of emerging technological innovations to enhance the safety of a chemical process plant.

- At IFFCO Kalol unit, application of digital technologies such as online databases, Geographic Information Systems (GIS), 3D modelling, 4D Computer-Aided Design (4D CAD), robotics, laser scanning, photogrammetry, wireless technology, sensor-based technologies, and automation have significantly increased the effectiveness of process safety management.
- An integrated system with robotic arms, bulk conveyors and automated storage and retrieval system (ASRS) has been installed for loading, unloading, storage and shipping of finished material at Nano Fertiliser Plant. This integrated system involves use of advanced robotics technology for material handling, eliminating human intervention thereby reducing incidents and injuries.

- **Distributed Control System**
  - The process control is sufficiently automated by a suitably designed high reliability instrumentation system.
  - Distributed Control Systems are provided in ammonia, urea, boiler, and other control rooms. Early warning alarms and provision of adequate pressure relieving systems are incorporated in critical areas to prevent possible mishap. The system provides various advanced features such as **trend analysis, remote DCS access to Key personnel, history logging, data logging, sequence of events etc.**



- Microprocessor based highly accurate protection relays for protection of panels, transformers, and other electrical installations.
- Online busbar and breaker terminal temperature monitoring system at 11 KV HT panel.
- Conventional MCCs are being replaced by Intelligent MCCs in a phase wise manner.
- Online Database: MSDS, safety manuals and SOPs have been made available to all the users through a common network drive in the computer system thus making it readily available for reference.
- **License Management System**
- IFFCO Kalol has established an online system of License management for ensuring the tracking of applicable licenses under various Statutory norms. If any license is going to expire, then, an E-mail alert will be generated to the concerned person to initiate renewal application of the said license.



- The maintenance history of equipments has been made available in the Plant Maintenance Management System Portal.
- **Proxy Switch (Laser Based Switch)** has been installed on Ammonia Pump and Ammonia Pump Assembly to detect any Ammonia Leak, from Ammonia Pump Plunger due to damage/ displacement of Tie Rod. In case of any minor ammonia leakage from the plunger due to damage/ displacement of Tie Rod, the Proxy Switch will detect the same and give alarm & subsequently will trip the running pump through the Trip System installed on DCS and a major accident /heavy leakage of ammonia due to damage in pump plunger can be averted.
- IFFCO Kalol has installed Yokogawa make ProSafe-RS, the world's first truly integrated "safety PLC" for the process industries system as Emergency shutdown system (ESD) for safety of man, machine and Environment. It is an independent system with Safety Integrity Level 3 (SIL-3). SIL3 system ensures that the frequency of risk occurrence is reduced to less than 1/1000 under the current conditions.
- If the process value continues in an unsafe direction and the trip level is reached, the SIS executes an emergency shutdown action, preventing the process from exceeding the safe levels.
- An online health monitoring system has been established for employees where the entire health checkup data and history can be retreived anytime for future references.
- CCTV cameras have been installed for safety at various critical locations.

- Ammonia and Hydro-carbon detectors for continuous monitoring of the working atmosphere.

- State of art portable digital gas detectors/ multi gas detectors with continuous data logging facilities are provided for monitoring of work environment for any hazardous gas/vapor.
- **Online Visitor Safety Management System**

  A system has been set up in which a visitor safety film is shown to all the visitors on safety aspects, do's and don'ts etc. at the visitor lounge at factory gate. After watching the film, the visitor has to undergo an online safety quiz through Visitor kiosk, based on the information displayed in the safety film. Gate pass is automatically issued to them after successfully completing the quiz through online system.

- Intelligent addressable microprocessor-based fire alarm system has been installed in the plant. It is also integrated with a clean agent extinguishing system. State of art beam detection system has been installed at Urea empty bag Storage area.

8. Significant Achievements:-

- Kalol unit has completed more than 12 years (4559 days till 31.12.2023) without any reportable accident.
- IFFCO Kalol Unit has been declared the winner of Prestigious "Platinum Award 2023 - For Highest Outstanding Performance" in manufacturing sector for the assessment period of 3 years (2020, 2021 and 2022) by National Safety Council of India (NSCI). IFFCO Kalol Unit has created history by becoming the first organization to qualify for this most prestigious award among all the applicant organizations from manufacturing sector.
- IFFCO Kalol unit has been awarded prestigious 'Sarvashreshtha Suraksha Puraskar' twice consecutively for the year 2021 and 2022 by National Safety Council of India for the excellent SHE peformance in the manufacturing sector.
- IFFCO Kalol Unit won the FAI 2022-23 Best Production Performance Award in Nitrogen fertilizer unit, Ammonia and Urea category.
- IFFCO Kalol has won FAI Environment award, safety award as well as Special Award for Research and Development/ Innovation for Development of Liquid Urea Fertilizer for the year 2020-21.
- The Training Centre at IFFCO-Kalol has been approved by Directorate of Industrial Safety and Health (DISH) for imparting HSE trainings as per section 111-A of the Factories Act-1948.
- IFFCO Kalol has established visitor safety management system.
- Approx. 2400 persons have been imparted safety & health training during the calendar year 2023.
- IFFCO Kalol has achieved the record of highest production of neem coated Urea with lowest energy consumption during the year- 2023.
- As a part of effective Solid waste Management system at IFFCO-Kalol, Composting machine with curing chamber Crusher / Shredding machine for handling of horticulture waste have been installed at site and Biodegradable waste such as Canteen & horticulture waste are being converted into manure.
- As a part of increasing tree diversity, 30000 Numbers of tree saplings have been planted in the complex during the year 2023-24.
- About 1032300 KWH of Power was generated by "Solar Energy" up to March 2024 (equivalent to 723 MT CO_2 emission reductions @ 0.7 kg CO_2/ KWh).

9. Conclusion

IFFCO-Kalol is committed to implement Safety management system seeking continual performance improvement. Genuine concern and sincere commitment of the top management, wholehearted efforts by each individual, demonstrative leadership, employee involvement, compliance of safety statutes and strict adherence to operating discipline and good engineering practices as well as use of advanced digital technology has brought in an ambiance where there is a total commitment of all the employees to get along with their jobs with lot of confidence and safety consciousness. Recognitions like Prestigious Awards from National Safety Council of India (NSCI), FAI Awards on Safety, Environment and overall plant performance, National Energy conservation awards from GOI etc. over the years are the testimony of endured efforts being put in by all the employees of

IFFCO–Kalol unit in achieving and maintaining high standard of Safety, Health and Environment in all facets of their work.

*Shri D.G Inamdar, Director (Kalol and Nano Fertiliser) and his team receiving the **"NSCI PLATINUM AWARD-2023".***

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Bharat Petroleum Corporation Ltd.

BPCL- Bina Refinery

(Manufacturing Sector- Group A- Sarvashreshtha Suraksha Puraskar – 2023 Award winner)

Sanjay B. Kamdi, Chief Manager (Fire & Safety), BPCL- Bina Refinery, MP., E mail- sanjaybhagwanji@bharatpetroleum.in

1. Company Profile

Bharat Petroleum, India's 'best performing' Maharatna Public Sector Undertaking, and its journey from being an Oil and Gas Company in India to a Fortune 500 oil refining, exploration and marketing conglomerate Bharat Petroleum Corporation Limited (BPCL) is an Indian public sector undertaking (PSU) under the ownership of the Ministry of Petroleum and Natural Gas, Government of India. It operates three refineries in Bina, Kochi and Mumbai.

The BPCL Bina Refinery was incorporated as a Joint Venture between Bharat Petroleum Corporation Limited and OQ SAOC (formerly known as Oman Oil Company SAOC) in the year 1994 to set up central India refinery under a bilateral agreement.

With significant co-operation from Government of Madhya Pradesh, BR set up a six million tonnes per annum (6.0 MMTPA) grassroots petroleum refinery at Bina, MP in serene surroundings of Bundelkhand. Dedicated to the nation in May 2011, by then Hon'ble Prime Minister of India, refinery produced environmentally compliant fuels of BS-VI grade.

Since commissioning, the Company has achieved significant milestones and expanded its capacity to 7.8 MMTPA in 2018-19 to cater to demand of petroleum products in the market and also have plans to foray into Petrochemical business.

In the year- 2021, the Company become wholly owned subsidiary of Bharat Petroleum Corporation Limited – a 'Maharatna' Public Sector Unit of Government of India. In July 2022 this refinery merged with BPCL.

Bina Refinery is certified to Quality Management System - ISO 9001:2015, Environment Management System - ISO 14001:2015, Occupational Health and Safety Management 45001:2018 and Energy Management System 50001:2018.

2. Process Description

The refinery is equipped with modern machineries and technologies and its product slate includes Liquefied Petroleum Gas, Motor Spirit, Superior Kerosene, Aviation Turbine Fuel, High Speed Diesel and Naphtha etc. Refinery has a fully automated Dispatch Terminal and consistently delivered high quality products by way of rail, road and two numbers of cross country pipeline vis Bina Kota Delhi pipeline & Bina-Panki pipeline.

The Refinery Processes Crude Oil, comprises complex chains of Hydrocarbons having Carbon and Hydrogen molecules and it also contains impurities like Sulphur / Nitrogen / Oxygen

compounds, Metals, etc. Crude are Paraffinic, Naphthenic or Aromatic types depending on their composition of Hydrocarbons. The refinery processes are classified into:

Primary Processing Units: The Crude & Vacuum Distillation Unit is the Primary Processing Unit, Wherein Crude Oil is separated into various products depending on the relative volatility of the Hydrocarbon components.

Secondary Processing Units: These units receive their feeds from the Crude / Vacuum Unit and upgrade it to value added products. These are:

- Full Conversion Two Stage Hydrocracker Unit
- Continuous Catalytic Regeneration (CCR)
- Isomerization (PENEX) Unit
- Delayed Coker Unit
- Kero Hydro De-sulfurization unit (KHDS)

Treating Units: These units play an important role in removing impurities like Sulphur, Nitrogen and Metals from the products thereby meeting the stipulated product specifications. These are:

- LPG Treating Unit
- ATF Merox Unit
- Diesel Hydro-treater Unit (Integrated with Hydrocracker) & Naphtha Hydro-treater Unit
- Sulphur Recovery Unit including VPSA.

3. Award & Accolades

BPCL, Bina refinery has been awarded several national awards for maintaining& sustaining the world-class safety standard in refinery operation. In 2022-23 awards received are:

a) Bina Refinery received **'Prashansa Patra-2022'** from 'National safety council of India' in consideration of sustained performance in manufacturing sector for good performance in

Occupational Safety & Health during 2019 to 2021.

b) BPCL-Bina Refinery received Prestigious **IMC RBNQ Performance Excellence Award 2023** in the Manufacturing Category. The Award Ceremony was held at IMC Chamber of Commerce and Industry, Mumbai.

c) Bina Refinery is awarded the **ET Energy Leadership Awards 2023** in the category **'Refiner of The Year'** in a glittering ceremony held at New Delhi.

d) **Bina Refinery** awarded FIPI award of **'Refinery of the Year'** (Below Capacity 9 MMTPA) in FIPI O&G Awards ceremony 2022 for achieving significantly higher levels of performance in production, operational efficiencies and energy conservation while meeting the norms of health safety and environment protection.

e) BPCL Bina Refinery has been conferred with the **"Platinum Award for Green Belt Development"** and **"Gold Award for Environment Excellence"** from Apex India Foundation in the Petroleum Refinery sector through the effective

implementation of Safety Management System, BR has built safety culture which has incubated safety in the day to day activities of the refinery. It covers safety in all aspects of plants and facilities like to control loss of personnel, equipment, material and environment. With the top

management driven approach, these systems are effectively implement and being sustained to the highest standard in the industry.

f) **ZERO Waste to Landfill Certificate:**

Bina Refinery got certified for **Zero Waste to Landfill certification** for more than 99% diversion rate by M/s. Intertek in record time of 3 months.

ZWL certification and gap assessment report had the following benefits:

a. Helped to eliminate pollution, in air, water and land which threaten public health & ecosystem.

b. Reduced ecological footprint by reduced material use through recycling of waste.

c. Further strengthen the culture of reusing waste.

4. Management's commitment to HSE:

4.1 **Safety Pledge:** All meeting & official program including trainings, workshops, seminars, etc. starts with safety pledge. The safety pledge starts with "I" which is indicates that I am rededicated towards safety at all level.

4.2 **APEX HSE Meeting:** is conducted monthly chaired by Executive Director and participated by senior management & HODs. All safety issues are deliberated and action plan are formulated for continual improvements.

4.3 Safety Tour and Night visit by senior management officials: Day & Night visit is aimed to improve monitoring of safety and alertness. Night visit schedule for the year is prepared by F&S and it is circulated by HR. Night duty officers have carry out joint visit of the refinery and other important facilities during any night shift of the week as per the schedule. Officer on special duty (i.e. CM) accompanied any one of the group within fortnight for the night visit. There is a separate format made for recording observations of this visit.

In Day visit there is a separate schedule of the visit by DGM, GM and CGMs. The visit done fortnightly and the seniors are accompanied by one of the safety officer for the visit. The visiting plant schedule is maintained and the report is prepared by the Safety Officer.

Day & night observations are circulated to concerned area manager & section head for liquidation & compliance of the same are discussed in the Area & APEX HSE safety meetings.

4.4 Safety, operation & maintenance review meeting refinery shift manager meeting: RCM meeting is conducted daily by CGMs, GMs, HOD & plant in charge, safety and maintenance officials and every Saturday this meeting is chaired by ED- Refinery. The meeting starts with day to day refinery safety concerns & issues. In the meeting immediate decisions are taken for safe & reliable operation of the refinery.

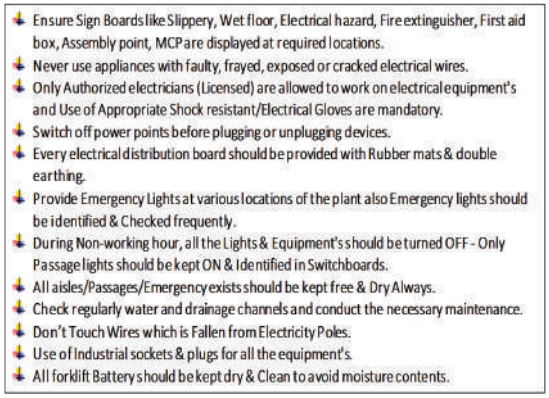
4.5 Motivational prize scheme: For all cadre of employees for motivation on safety for maximum Near Miss reporting by employees & contractor workers.

For maximum Safety suggestion reporting by employees & contractor workers.

For highest safety observation reporting department.

Safety awards to service providers on completing year without any accident.

4.6 Monthly Safety Drive: Safety drives on various safety topic circulated to all the employees and service providers in first week of every month.



4.7 Safety Suraksha Magazine: Bina Refinery publishes a quarterly magazine/newsletter **"Suraksha"** in which new safety techniques, inventions, case studies with lessons, coverage of Health, Environment and Safety related

articles participated by all employees is mentioned.

4.8 Monthly Mock Drill: Mock drills conducted based on realistic emergency scenarios to check the efficacy of preparedness to handle emergencies. The outcome from mock drills are taken into account to update the plan. Emergency siren tested daily.

Level - I & II emergency mock drills are conducted on monthly basis.

Level - III (Onsite & Offsite) mock drills are conducted every six months. Mutual Aid Member also participates in the mock drill.

Offsite Level - III mock drills are conducted under coordination of District Authorities / Civic administration.

5 Employees, participation and involvement in SHE:

5.1 Safety Activity Rate (SAR): A Tool for Contractor Safety Management. The safety activity rate is the overall safety promotional & awareness activity which includes Near miss reporting, Toolbox Talk, unsafe condition, unsafe act reporting, safety training & safety inspection conducted in a year with respect to total contractor's employee present & man hours worked in a year/month.

5.2 Area Safety Committee Meeting: Area safety meeting is conducted monthly at 15 areas/units of Bina refinery. Area in charges with participation from all concerned employees and staff conduct this meeting and discuss the safety issues and way forward for compliance.

5.3 Contractors Safety Meeting: The meeting conducted monthly chaired by Maintenance head assisted by HSE head and participated by contractor site in charge, contractor safety supervisor and worker, Engineer in charge, Representative from fire and safety department, Representatives from Health & Environment department. Best near miss and safety suggestion awarded in the meeting.

5.4 Off The Job Safety Meeting: The meeting conducted quarterly and chaired by commercial head and participated by multidisciplinary team for catering the Off the job safety related points. In this meeting the committee discuss various measures to improve Road

Safety inside refinery & township & Off the job Safety in township area.

5.5 **Toolbox Talk:** Toolbox talks are conducted in supervision of concerned engineer & employee of the area. All the job starts only after TBT is conducted.

5.6 **Life Saving Rules:** 12 life saving rules are the part of training and given to every employee's and contractor's employee for ease of understanding.

5.7 **Fire Fighting Training Ground Facility:**

The fire training ground at BPCL Bina Refinery is constructed in an open ground having dimensions of 80 M X 100 M. It consists of various modules and facilities. Safety provisions are also taken into considerations by providing suitable vents on various modules to avoid excess pressurization of hydrocarbon vapors. This has helped to develop in-house experience for firefighting at various level and we have observed that proactive action taken by field staff before the arrival of actual firefighting crew.

5.8 **Improvement in work permit system:** Mandatory work permit training to all gas safety inspectors (GSI)/Fire Zone signatories (FZS), permit issuers and receivers. Authorization for role of GSI/FZS approved only after training on work permit system which is valid for 01 years.

5.9 **Process Safety Management (PSM):** Bina Refinery has voluntarily adopted for Process Safety Management (PSM) initiative, to ensure that all the hazards existing in the organization are identified and proactive control, monitoring/audit is in place thereby, avoid major process safety incidents. It is an integrated, systematic approach to implement a process-safety system across these business functions in a consistent manner that is important to sustain strong PSM-related performance. This will thereby control the risk of major accidents.

6 Special efforts and approaches to HSE and significant achievements;

6.1 Mandatory F&S training: are conducted with hands on practices of firefighting equipment for employees and service providers on regular basis.

6.2 Incident sharing: with employees & contractor workers in various forums like monthly safety day, on the job training and during class room training etc.

6.3 Safety training by newly joined engineers: in a step towards inculcating safety culture in the newly joined engineers (from other discipline like electrical, mechanical, chemical etc.) are encouraged to conduct various safety training. This step has made them thorough with all safety system and procedure applicable for refinery operation. All engineers have conducted training each on various

topics like work permit system, safety during hot job, work at height safety, excavation safety etc.

6.4 Construction of Blast Resistance buildings:

Bina refinery has constructed New Blast Resistance Building to enhance safety to Plant Operating Personnel working in the proximity of process units. Also to fostering a secure and safe environment for the Operating Team

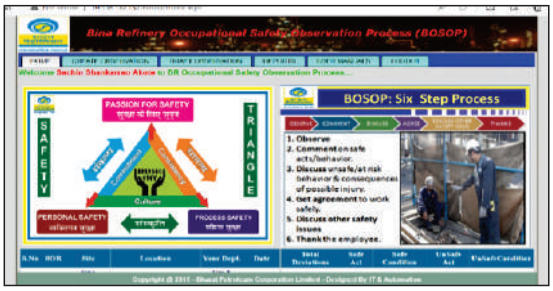
7. Improvement in safety management system through digitalization.

7.1 Digital display screen for Safety: To improve the safety culture amongst the contract workmen and keep them aware about the basic safety rules to be followed inside the Refinery, four large LED Display Screens have been installed, in which Workplace Safety

Rules are continuously being displayed in local language with safety images for effective communication amongst them.

7.2 Hot and CSE permit display dashboard: a dashboard developed for real time hot and CSE jobs display at BR intranet through hot job display portal. Benefit: ease in identification of all hot job locations on single dashboard, improvement in permit compliance monitoring etc.

7.3 **Bina Refinery Occupational Health Safety Observation Process (BOSOP):** portal -- It is a behaviour based safety program. By implementing BOSOP, our company has made a real progress towards safety culture development that is visible and relevant. It



helps in preventing injuries not by penalizing or rewarding but by improving workplace conditions, working procedures and by changing unsafe behaviour.

7.4 **Action Taken Report portal:** BPCL Bina Refinery has developed a "ATR" (Action Taken Report) portal for tracking the status of all HSE related actions. Online status reports are generated to track the completed/pending

work along with pictorial graphs on the stages of implementation

7.5 **E- work permit system portal:** The Work Permit System is an important tool for ensuring safety in hydrocarbon processing / handling industry. E- Work Permit System is a procedure to authorize to carry out the work in

a controlled manner. The procedure explains the precautions to be taken to ensure the safety of personnel, installations and environment while performing the work. Isolation verified before work begins and LOTO equipment are put in place. The purpose of this document is to provide uniform guidance for permitting all operational / maintenance / construction work and to identify precautions to be taken in order to:

a. Ensure safety of personnel.

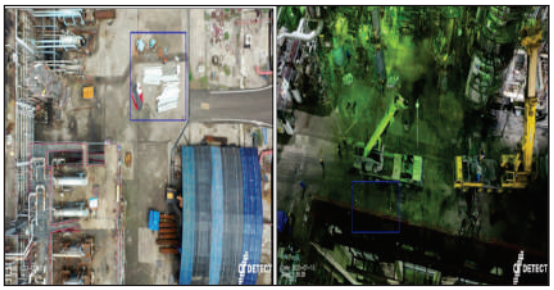
b. Avoid damage to environment and assets.

c. Comply with the statutory requirements.

7.6 **Safety suggestion portal:** BPCL Bina Refinery has a safety suggestion portal in which all the safety suggestions are reported and its

compliance are monitored. Best suggestions are awarded by top management in quarterly basis.

7.7 **Drone Surveillance during Refinery Turn Around (Digital Turn Around):** As a part of continuous improvement initiative and with the endeavor to make digitally enable

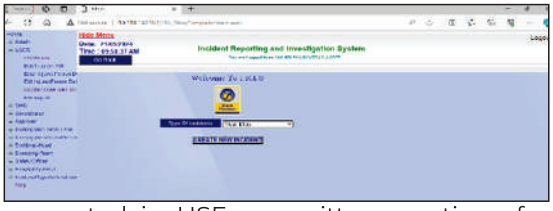


turnaround, Bina Refinery implemented integrated digital turnaround solution for effective HSSE monitoring.

7.8 **Online Vehicle Pass portal:** The objective of contractor vehicle pass application is to capture all details of contractor vehicles which are supposed to be plying within the Refinery Premises regularly and whose entry will be permitted by Security and Fire & Safety based

on the Vehicle Pass allotted to them.

7.9 **Incident Reporting and Investigation System (IRIS) portal:** At BPCL Bina Refinery, each incident/fire is investigated as per the existing Incident Reporting and Investigating System (IRIS) and all recommendations are tracked throu h online. Also, the status is



presented in HSE committee meetings for lesson learning and timely completion of recommendations.

7.10 **Online interlock bypass portal:** Online portal developed for interlock bypass system with online approval based on the days of bypass (07 days – plant manager, less than 15 days –

Chief Manager, more than 15 days – GM process and more than 30 days –CGM-Mfg.) easy monitoring of all bypassed interlocks, unit wise data available in the portal.

7.11 **Clamp Monitoring System:** In clamp monitoring system all the hydrocarbon and non-hydrocarbon pipeline leakages are reported in online system by the respective

units. All these lines are tracked through online at different levels. Also, the status of the same is presented in APEX HSE committee meetings.

7.12 **E-MOC Portal:** management of change (MOC) which is an integral element of safety management system is done through online software. Suggested change as per user department is request in initiation form

through online e-MOC portal. TS/ES department studies the feasibility of the proposed scheme in same online portal. All the stages of management of change i.e. feasibility study, HAZOP etc. are done in online software and finally scheme for change is issued through this portal.

7.13 **Vehicle Speed Monitoring System (VSMS):** Vehicle Speed monitored through various cameras installed at strategic locations.

The notification of over speeding vehicles driven beyond permissible speed limits is sent to the concern by SMS and e-mail with similar information to HSE department.

7.14 **Live streaming cameras over Fire Vehicle:** The cameras are installed over fire tender for live streaming of site emergency handling footage to Fire station. The movement of cameras are controlled from fire station.

8 **Conclusion:** Safety is an integral part of BPCL Bina Refinery and is inbuilt in the vision and mission of our company. All procedures and best practices w.r.t. plant operation, maintenance and HSE Management are well documented, reviewed and updated time to time based on experience and consultation with technical experts. "OUR MOTTO, SAFETY IN TOTO" is our slogan. In line with this objective, the refinery has been built with state-of-the-art technology with the highest level of protection. All safety systems are implemented to control the hazards associated with the refinery operations to levels that are consistent with the Bina Refinery commitment to Health, Safety and Environment

These safety systems are intended to protect personnel from injury and prevent significant environmental harm, property damages. Since refinery is highly fire prone industry hence state of art modern fire-fighting equipment

and systems are in place to tackle any mishap. The regular safety training of all stakeholders including contractor personnel is the key element to achieve highest safety standard towards journey of achieving excellence. As a result of robust safety system BPCL BR has completed 13 years (since inception) without lost time injuries to employees i.e. 4748 LTI free days till 31st Mar'2024. This records shows the commitment & highest standard of safety practices being followed by management, employees, contract workers & all stakeholders.

NSCI National Safety Award - 2023

Team BR receiving "Sarvashreshtha Suraksha Puraskar" (Golden Trophy)

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Hindustan Petroleum Corporation Limited

Mundra - Delhi Pipeline, Jaipur, Rajasthan

(Manufacturing Sector - Group A1- Sarvashreshtha Suraksha Puraskar – 2023 Award winner)

1 Background of the factory

Hindustan Petroleum Corporation Ltd. (HPCL) is a major Public Sector Oil Company engaged in refining, marketing and distribution of petroleum products in India. HPCL has been conferred with MAHARATNA status in the year 2020. MDPL Head Office (HO), HPCL at Jaipur is operating a group of pipelines of Mundra Delhi Pipeline (MDPL), Palanpur Vadodara Pipeline (PVPL) and Awa Salawas Pipeline (ASPL).

MDPL: 1053 Kms Long cross-country Pipeline known as the Mundra Delhi Pipeline with a Pipeline Diameter of 18"/16" starting from Mundra in Gujarat State & terminating at Bahadurgarh in Haryana. Design Capacity of MDPL is 8 MMTPA (Million Metric Ton per Annum). Under MDPL HO jurisdiction of MDPL is up to 889 KM in addition to PVPL (235 KM Long) and ASPL (93 KM long). The Pipeline consists of a product Pumping Station at Mundra (Gujarat), intermediate Tap Off cum Booster Stations at Palanpur (Gujarat), Ajmer (Rajasthan) & Jaipur (Rajasthan), Intermediate pumping stations at Bhachau (Gujarat), Santalpur (Gujarat), Pindwara (Rajasthan), Awa (Rajasthan)

PVPL: HPCL has laid a Petroleum Product spur line for transmission of finished petroleum products from the Tap off point Palanpur (Gujarat) to Vadodara (Gujarat). The pipeline length is 235 km & 18" diameter. Associated facilities along the pipeline route are 5 nos. SVs (sectionalizing valve stations) and one IPS (Intermediate Pigging Station). Palanpur is common station for both pipelines MDPL and PVPL

ASPL: HPCL has laid a Petroleum Product Pipeline for transmission of finished petroleum products from the Tap off point Awa (Rajasthan) to Salawas (Jodhpur) Rajasthan. The pipeline length is 93 km with 10" diameter. Associated facilities along the pipeline route are 2 nos. sectionalizing valve stations at chainages 33.23 & 66.71 km respectively. Awa is common station for both pipelines

MDPL HO handles total length of more than 1210 Kms length of pipelines, spanning through states of Gujarat & Rajasthan in India. Pipeline transportation of petroleum products is proven to be more eco-friendly, safe and economical compared to all other means of transportations.

2 Commitment of the top management to SHE (Safety, Health & Environment)

To management at HPCL - MDPL is very much committed to adopt and implement best SHE practices. At MDPL, we have a well-defined, written HSE policy; reviewed and adopted every year or after any change in Process or change in Top management of the factory. It clearly states that as an integral part of our' business, we strongly believe that no work, service, or activity is so important or urgent that safety be overlooked or compromised. Safety of employees and Public protection as well as corporation assets is paramount and a way of life at HPCL-MDPL. MDPL considers that safety is one of the most important tool, that enhances productivity and helps reducing national loss.

HPCL in its vision statement itself has stated that the

Company will be a model of excellence in meeting Social Commitment, Environmental, and Health and Safety norm. It also has also stated that Company will give highest priority to enhancing safety and environment protection. To ensure this, company shall spare no efforts and adopt state of art technologies, best engineering standards and best in class work practices. The company is committed to provide a culture that supports safety as NUMBER 1 PRIORITY and provide excellent training to employees, contractors and its stakeholders. Bilingual (Hindi & English) Health.

To further stress upon the quality & safety in all areas of operations in MDPL, we have also adopted a QEHS policy which is made part of IMS and reviewed periodically along with other IMS documents. The policy for MDPL was first adopted in the Year 2007. Since then, it is periodically reviewed and updated. Latest updation of QEHS Policy was done and signed copy of QEHS Policy was issued by MDPL In-Charge with effect from 22.01.2024.

Top management reviews HSE performance of MDPL at different frequency viz. daily, monthly, quarterly, half yearly and yearly through Daily incident report, Monthly HSE reports, Security and HSE index, Safety committee report, MARG, Internal audits and safety audits.

Gaps, Suggestions, Feedbacks so received from the Top Management being taken in the true spirit, detailed root cause analysis done, compliance / implementation action plans are drawn and horizontal implementation are ensured. Collective participation, suggestions / feedback are taken in brain storming sessions / video conferencing,

wherein Top Management also participate and provide with valuable inputs.

All necessary technical / financial approvals, guidance, mentoring are a source of inspiration and motivation that is received from the Top management for effective implementation suggestions across the installation. This has helped location achieving continuous improvements, implementing series of innovation and wining various national/international awards.

To create a collaborative environment that promotes safety as a shared responsibility throughout the organization, Half-yearly Management Review Meetings (MRMs) are conducted in MDPL which are attended by complete top management of MDPL including Pipeline Head, Department Heads at HO, Location Heads and Management Representative. These meetings serve as a crucial platform to promote a strong safety culture and ensure the well-being of employees. The objectives of these meetings are -

- Safety Awareness: Reinforce the importance of safety in the workplace and create a safety-conscious atmosphere among employees.
- Communication: Facilitate open communication between top management and the workforce about safety concerns, incidents, and best practices.

- Policy Review and Implementation: Review existing safety policies and procedures, and discuss their effective implementation throughout the organization.
- Incident Analysis: Analyze previous safety incidents to identify root causes and develop strategies to prevent similar occurrences in the future. Safety Training: Discuss safety training needs, evaluate the effectiveness of current training programs, and plan for additional training sessions if required.
- Performance Evaluation: Review safety performance metrics, assess progress towards safety goals, and make necessary adjustments to improve safety outcomes. & Recognition and Incentives: Acknowledge and reward employees and teams for outstanding safety practices and contributions to the safety program.
- Equipment and Infrastructure Safety: Discuss the maintenance and inspection of equipment and infrastructure to ensure safe operations.

3 Employees' Participation & Involvement in SHE matters

Corporation has well established HSE set up, with assignments of responsibilities clearly defined right from corporate level, Refinery level, Marketing SBUs, Pipeline SBU level to until individual locations. Executive Director (HSE- Marketing) & Executive Director HSE (Corporate & Refineries) at HQO-Mumbai, has overall control on HSE activities, responsible for review, evaluation and enabling locations with apt resources, infrastructure and in time approvals.

At Project & Pipeline SBU Level: Deputy General Manager- HSE is responsible for SBU HSE activities, including Audits and compliances. Then down the line, MDPL has very senior and experienced DGM-HSE who is overall in-charge of HSE for all MDPL locations and he is supported by Senior Manager-HSE. All pipeline locations have a Designated Safety Officers (DSOs), responsible for HSE activities specific to the location.

Assignment of Responsibilities at Various Levels for implementation of the HSE policy at MDPL is as below:

- HSE policy of the organization is finalized and signed by C&MD of HPCL and the same is displayed in English, Hindi & local language at all the locations of HPCL.
- To implement the HSE policy, HSE objectives and targets are decided by TOP MANAGEMENT (Directors and Executive Directors) after a lot of brain storming discussion in AOP Meet, which is conducted every year just at the starting of the financial year.
- To implement the HSE policy at the locations, HSE programs like Sachet, Ekagra, Safety & Security Index are built to achieve HSE goals by CGM & GM rank Officials at HQO & HO level.

The activities undertaken by Line Managers to achieve HSE objectives in their Departments / Sections.

1. Location In-Charge ensures and enhances the Safety culture among officers and workmen at the location.
2. To implement the HSE programs at MDPL Locations, MDPL-HO prepares and project Yearly budget to for marketing expenses and for capital projects for the locations.
3. Location In-Charge ensures Implementation of the Capital projects to enhance the safety of the location and also ensures utilization of marketing expenses for maintenance of the existing HSE facilities and infrastructure at the locations.

4. Location In-Charge also ensures full automation of the safety facilities, safety interlocks integration with PLC & SCADA system, monitoring & control of critical operating parameters, implementation of SOP etc.
5. Ensure celebration of Electrical Safety Week, Fire Safety Week, Road Safety Week, World Environment Day etc. programme as per direction received from HO to reinforce behaviour-based safety culture in employees and contract workmen at the locations.
6. Ensure display of fire organization charts, HSE policy, Standard Operating procedures, Do's & Don'ts of equipment etc.
7. Ensure the compliance to OISD requirement at locations.
8. Ensure compliance for HAZOP study and Risk analysis.
9. Innovations in fire & Safety are implemented at locations and its integration with PLC & SCADA system is ensured.

4 Implementation of the recommendations of studies, audits, committees

At all MDPL Locations, Internal OSH Audit is conducted quarterly as per OISD 145. Multidisciplinary safety audit (MDSA) is conducted through Internal OSH Audit Team comprises HQO HSE Chief, HSE In- charge/Location head of other Pipeline Locations. This team thoroughly inspect preventive, predictive maintenance, updated drawing, layout, safety & security management, logics, alarms, tripping protocols, testing and calibration of equipment, Equipment efficacy and performance, Statutory quality controls, Statutory and legal compliances, trainings and feedback system. Major initiatives and improvements made by the location w.r.t OISD, OEM, SOPs and statutory requirements on safety, health and environment of man, machine, material, environment and processes are also highlighted and shared with other location for overall development / upgradations. Upon inspection, report is submitted to the top management at HQO, with a copy to the Location for compliance and implementation of recommendations.

External Safety Audit- External safety audit of Mundra Delhi Pipeline is being carried out annually. The audit is carried out by a team of certified third-party experts. They visit and inspect all locations of MDPL and its sectionalizing valve stations. The audit starts with an opening meeting at the dispatch station and proceeds to the terminal station. The observations and finding are discussed at each location. Finally, the agency provides an audit report comprising of its observations and recommendations. Based on these recommendations the management of MDPL sets

targets for compliance and review.

T4S Audit - PNGRB ACT regulations mandates T4S audit every three years for multi-product pipelines (Technical specification audits). The audit team are experts in pipeline operations and maintenance. They have knowledge and experience in pipeline projects. The organization is accredited by PNGRB for the audit. The team audits each and every location and on sample basis few SV stations under each location. The audit checklist as per PNGRB is used for auditing. The audit process is exhaustive with field inspections, document checking and demonstration of the emergency preparedness and adequacy.

OISD Safety Audit – Every five years, OISD Audit is conducted by dedicated team from Oil Industry Safety Directorate which consists of experienced members from OISD and different OMCs. Whole purpose of the Audit is to check overall Safety standard of the location. This team thoroughly inspect preventive, predictive maintenance, updated drawing, layout, safety & security management, logics, alarms, tripping protocols, Fire & Safety systems, testing and calibration of equipment, Equipment efficacy and performance, Statutory quality controls, Statutory and legal compliances, trainings and feedback system.

OISD Safety Audit – Every five years, OISD Audit is conducted by dedicated team from Oil Industry Safety Directorate which consists of experienced members from OISD and different OMCs. Whole purpose of the Audit is to check overall Safety standard of the location. This team thoroughly inspect preventive, predictive maintenance, updated drawing, layout, safety & security management, logics, alarms, tripping protocols, Fire & Safety systems, testing and calibration of equipment, Equipment efficacy and performance,

Statutory quality controls, Statutory and legal compliances, trainings and feedback system.

Once the final report received, a meeting is called at HO level as well as location levels. For each improvement, concerned officer responsibility is assigned and target is fixed. Monthly all points compliance status is being reviewed by location in charges and report to be submitted to head office.

Head office reviews the report and submit compliance and action taken report to HQO on monthly basis. HQO in turn submits the compliance to the external agencies OISD/PNGRB along with all the supporting documents. All these points to be complied as per timelines decided by OISD/PNGRB.

If the external agency is satisfied with response submitted, then they close the audit observation and the same stands complied.

5. Special efforts and approaches to SHE and significant achievements

"Safety First" culture is widely inculcated until the last worker/Stake holder at the installation. Employee understands the importance of safety that enhances productivity. The organizational goals are achieved, implementing and adhering with safest operational means. Loss control meetings are conducted with participation of workforce that includes employees, security, contract personnel and other stakeholders. All safety health matters are discussed and corrective, preventive measures are taken in time bound manner. Employees and workforce undertake planned general inspection. Feedbacks taken therein effectively addressed in process improvements, initiatives, innovations and implementation of best of best practices and compliances. This built a healthy bonding with working personnel and has brought all round outstanding performance year by year.

"Every worker is a safety implementer" is the key operating slogan at the location. Any unsafe act or envisaged risk or potential hazard is immediately brought into the notice of management or workers are empowered even to "Stop any unsafe process or act" on there and then basis. This has immensely motivated workers and helped location attaining various technological and process improvement. Location workers takes prompt action with active participation of workforce in implementing mitigation measures on envisaged risk, potential hazards, identified thru occupational health hazard survey, planned general inspections, same is deliberated in Management Review & Safety and Health Committee Meetings, Brother to brother safety compliance groups. Safety suggestions so received from fields are complied with corrective & preventive measures for horizontal implementation and monitor compliance status of recommendations.

Various Safety Incentive Scheme like Safety Quiz, Essay Writing, Slogan Writing and Physical Competitions have been organized for workman for HSE awareness. Safety Magazines, Safety Newsletter and Safety booklets have been circulated among employees and workman for awareness towards safety.

Details of competitions are as follows-

1. Safety Quizzes
2. Physical Competitions
3. Essay writings
4. Slogan writings

Safety training programs were organized for workmen in all locations of MDPL during fire safety weeks. Various motivational programs like rewarding Best Safety Practices/ suggestions or disciplined use of /PPE are also part of our HSE Management. In AOP Meeting also target has been set for zero incident and zero tolerance to unsafe culture.

To increase the safety culture among the workers & security staff, an initiative on behavioral based safety 'SACHET' is implemented at MDPL. Multi programs were organized under this scheme. SACHET cards distributed to all contract workmen. Safety badges also awarded to workers, who followed the safety rules & increase the safety awareness among co-workers.

6. Use of advanced digital technology (AI, AR/VR, Robotics, Drone etc.) to enhance safety

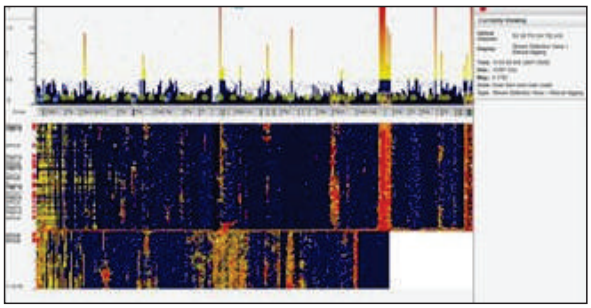
HPCL MDPL runs its business adopting innovative approach/measures in HSE Management practices beyond the scope of statutory requirements. MDPL has been pioneer in implementing innovative ideas, initiatives, best of Industrial practices, and technological upgradations to its HSE Excellence. State of Art technology, fully automated SCADA and PLC based operations and safety management system, Series of interlocks, Alarms and Tripping Mechanism, Legal and Statutory Compliance, Robust training management and evaluation system, managed through highly motivated, competent and dedicated workforce and active stakeholders supply chain makes MDPL a strong contender to various National Awards, accolades and Certification

We at MDPL strongly believe that Public safety is paramount and at no point of time, public safety shall be compromised.

Few of Significant HSE initiatives and innovative approach/measures adopted at MDPL/ASPL/PVPL towards safety excellence are as follows;

1 Pipeline Intrusion detection System (PIDS): PIDS works on the principal on detecting the disturbance of transmission of laser signal to and fro in certain length of OFC. This detects manual, mechanical disturbance in the vicinity of the pipeline.

2 Security tracking system (STS): STS ensures the real-time tracking of security line walkers who are doing physical inspection and it is based on the mobile application with GPS feature.



3 Dedicated OFC based communications between all the stations for seam less operations.

4 UV/IR Flame detectors, heat detectors and Hydrocarbon detectors in Pipeline process areas.

5 High-Definition CCTV (Close circuit television) Network (Dedicated Optical fibre network with back up).

6 Health & Safety Portal is provided to monitor the performance, learn from failures and improve the health and safety management system.

* * *

Supreme Petrochem Ltd.

Raigad – Maharashtra

(Manufacturing Sector - Group B – Sarvashreshtha Suraksha Puraskar – 2023 Award Winner)

1. Background of the factory

Supreme Petrochem Ltd. (SPL) is engaged in the business of manufacturing and sale of Polystyrene. SPL was founded and incorporated in 1989 at Mumbai, promoted jointly by the Supreme Industries Limited and R. Raheja Investments Pvt. Ltd. SPL has a state-of-the-art manufacturing facility located at Amdoshi-Wangani, Wakan-Roha Road, Tal. Roha, Dist. Raigad, 110 Km from Mumbai. The manufacturing facility at this location started as a green field project in November 1993 and commenced commercial production in October 1995. This infrastructure is geared to handle more than a million tonnes of polymers. The installed capacity of the plant is 435000 MTA of polymers. The range of Styrenics products manufactured by SPL includes Polystyrene (GPPS and HIPS), Expandable Polystyrene (EPS), Expanded Polystyrene (XPS) Insulation Boards, Styrene Methyl Methacrylate (SMMA), and Specialty Grades/ Compounds/ Master Batches of Thermoplastics & Elastomers.

SPL is committed to ensuring safety in all of its operations, protection of the health of every employee and protection of the environment. Since its establishment, this commitment has formed the basis of SPL Policy related to Health, Safety and Environment. Also, SPL is committed to manufacturing products in an environmentally safe and responsible manner. Continuous efforts for improvement in quality, environment, health, and safety systems are made through.

- Setting objectives to continually improve performance in HSE.
- Complying with the HSE legislations.
- Adopting suitable safety and environmental practices and proactive measures to minimize associated hazards and risk arising due to industrial activities.
- Designing our processes and plant operations to minimize risk & wastage.
- Enhancing the skill and competence of the employees through training.
- Reducing consumption of energy and natural resources.
- Reducing the carbon footprint as a part of the ESG journey.
- Maintaining Safety, Health & Environment Management Systems in accordance with ISO 45001:2018 and ISO 14001: 2015.

2. Commitment of the top management to HSE

SPL top management is fully committed to the cause of HSE. The top management reviews the periodic reports from the Factory on HSE performance at planned and defined intervals. These reports include details on Daily HSE Exception, workplace safety, process safety, environmental safety, fire protection and HSE Statistics, HSE Concerns / Constraints and other interface issues.

The management is also reported about the details of review of technological and financial resources, HSE resource utilization, synopsis/ exceptions from risk management report, Summary of HSE Objectives and Programs etc. Periodic Management Review for Environmental Management System and Occupational Health and Safety Management System, Quarterly Report on Compliance Status of applicable HSE legislation, Necessary suggestions on improving the overall HSE performance at the site are given by the top management and actions are initiated accordingly.

Regular safety walkthroughs of the factory are taken by the top management of the company. In the safety rounds, safety aspects of various areas of the complex are identified and communicated promptly to the concerned. Decisions are taken accordingly for immediate Corrective actions and compliances. Also, directions are provided by the top management for the issues related to improvement in Management Systems, Procedures and Practices. “HSE Only” meetings are conducted regularly by the top management of the company. A detailed review of performance of the HSE Management System is done in these meetings. HSE based observations are discussed and decisions & recommendations of the top management are communicated to the concerned promptly.

NSCI Sarvashreshtha Suraksha Puraskar 2023
Manufacturing Sector - Group B

Winner - Maharashtra Safety Award Competition-2022
by National Safety Council - Maharashtra Chapter

The factory has IMS Policy integrating Occupational Health and Safety, Environmental and Quality systems. Occupational Health and Safety, Environment and Quality Policy are integrated and Integrated Management System (IMS) policy is prepared. The policy is reviewed and updated periodically during management review meetings. SPL is certified with ISO 45001: 2018 standard for Occupational Health and Safety, ISO 14001:2015 for Environment Management and ISO 9001:2015 for Quality Management.

The objectives of the HSE Policy are achieved by using following mechanisms:

HSE Objectives are derived from Company's Business Plan. HSE Business Plan is an integral part of Company's Overall Business Plan, which is developed based on various inputs such as,

- Results of Previous years' HSE Business Plan compliance / HSE Management Programs.
- Current Risk Assurance Status / Risk Assessment Reports.
- Existing, new, and proposed legislation and regulatory requirements.
- Specific recommendations / suggestions coming out of safety committee meetings, mock drill reports, internal/ external audits, investigation reports of HSE non-conformances / accidents / incidents, inspection reports by involving workers.
- Technological and financial resources utilized.
- Directives from Management Reviews of IMS.

Based on the HSE Business Plan, each department has developed annual HSE Objectives, Environment Management Plans, Tasks, and Targets (OTTs) along with required resources and action plan target dates to achieve the set objective. Status or progress on achieving HSE Objectives and Targets is reviewed in monthly performance review meeting with senior management. In addition, a register of Occupational Health and Safety Management Programs (OHSMPs) is maintained at departmental level for identifying and tracking of ongoing HSE objectives and their compliance.

3. Employees' participation and involvement in HSE matters

Employee participation is important to develop a sound safety culture in any organization. SPL understands this and has a defined approach towards this cause. Deliberate efforts are taken to improve employee participation through various schemes, activities and systems related to HSE matters.

An Apex level safety committee is established to review the HSE related observations, deviations, and matters. This committee includes representatives of all the departments including managers, heads, shop floor executives and team members. The committee is headed by the Director (Operations) of the Company and the Head-HSE is the co-ordinating secretary. Apex Safety committee meetings are held every month and HSE matters are discussed, and actions are initiated. Apart from this, departmental safety committee meetings are conducted which involve both Company and other employees.

Involvement of employees in HSE activities

Involvement of employees in HSE activities

Apart from this, employees' involvement is encouraged in following ways at SPL:

- Risk Assessment: All employees participate in Hazard/ Aspect identification and risk assessment which is an ongoing process.
- Joint HSE Inspections - Periodical HSE inspections are conducted by Concerned Area Operator and Operator from HSE Department.
- Self HSE inspection: Area operators conduct daily self-inspection of HSE systems at respective areas.
- Daily Field Rounds: HSE Department representatives and area operators take daily round of their respective areas for positive as well as negative findings and initiate immediate actions to close the HSE deviations/ observations if any.
- Internal HSE Audits: Employees are involved in conducting Internal cross function area audits of OHSMS and EMS as per standards.
- Auxiliary Fire Squad: All employees including contractors are trained in different types of fire, first aid, rescue drills and they become part of Auxiliary Fire Squad. Fix numbers of AFS members are available 24x7 inside the premises.
- HSE Campaign: Annual Fire Safety Campaign is organised for the period of 4th March to 14th April every year.
- HSE promotional activities: such as Suggestion scheme, poster and slogans, maximum reporting of near misses, best HSE training assignment, special HSE studies, Quiz etc.
- Screening of HSE films is done during HSE refresher training programs.
- Fire and Safety Exhibition: organized as a part of inaugural function of a month-long Fire and Safety Campaign.
- Monthly HSE Newsletters, case studies, HSE Flashes on incidents are circulated to all employees.
- Fire and Safety Drills for Officers, Technicians and Contract Employees.
- Discussion on Process Safety Incidents and case studies: The relevant incidents are explained to all shift in-charges, Panel Engineers, Technicians / Operators and contract employees and corrective actions initiated/implemented accordingly.
- Virtual training of various external agencies on EHS topics
- Employees are involved in development of HSE procedures, reporting and investigation of incidents and improvement in HSE arrangements such as access, egress, emergency mitigation measures, training etc.
- Industrial Visits: Safety committee members

visit neighbouring industries for sharing of HSE practices. Organising visits of members of neighbouring industries to our plant.

- Special immunization campaign was organized for tetanus and SPL, Contract Employees and their family members have been benefited by this program.
- Blood donation camp is organized at SPL Works annually.
- Employees are participated in studies like HAZOP, PSSR, SIL, LOPA etc.

HAZOP Training by external faculties

Pre-Startup Safety Review

Knowledge sharing programs to MARG members

4. Implementation of the recommendations of studies, audits, committees, etc.

Implementation of proactive and reactive monitoring techniques such as inspections, audits, work environment, health, equipment monitoring for mechanical integrity is carried out effectively at SPL.

Following are features of the monitoring techniques at the factory:

4.1 Occupational Safety & Health Audit System

Internal audit is carried out for Occupational Health and Safety Management System (OHSMS) and Environmental Management System (EMS) under Integrated Management System (QMS, OHSMS & EMS). Audit Team consists of qualified and trained internal auditors (including Officers and Technicians). Audit review meeting of auditor and auditee is conducted under Chairmanship of Factory Manager to discuss the audit findings. Thereafter Audit reports are submitted to the auditee within one week of conducting the audit. It is the responsibility of auditee to comply with the audit findings. Compliance on the audit findings is presented by the HODs during weekly co-ordination meetings. Compliance of the audit points is one of the attributes for assessing HSE performance of the department. All the audit findings are reviewed by senior management during management review meetings.

External audit is carried out once in a year for Integrated Management System (including QMS, EMS and OHSMS) for certification of ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 standards. All audit findings are reviewed by senior management immediately after every audit and action plan is prepared.

T4S Audit - PNGRB ACT regulations mandates T4S audit every three years for multi-product pipelines (Technical specification audits). The audit team are experts in pipeline operations and maintenance. They have knowledge and experience in pipeline projects. The organization is accredited by PNGRB for the audit. The team audits each and every location and on sample basis few SV stations under each location. The audit checklist as per PNGRB is used for auditing. The audit process is exhaustive with field inspections, document checking and demonstration of the emergency preparedness and adequacy.

OISD Safety Audit – Every five years, OISD Audit is conducted by dedicated team from Oil Industry Safety Directorate which consists of experienced members from OISD and different OMCs. Whole purpose of the Audit is to check overall Safety standard of the location. This team thoroughly inspect preventive, predictive maintenance, updated

drawing, layout, safety & security management, logics, alarms, tripping protocols, Fire & Safety systems, testing and calibration of equipment, Equipment efficacy and performance, Statutory quality controls, Statutory and legal compliances, trainings and feedback system.

Involvement of employees in HSE activities

Audit and Inspections

4.2 Risk Assessments and Studies

SPL is Major Accident Hazard (MAH) installation under Rule 10 of the MSIHC Rules 1989. Safety audit is conducted externally by competent person as per legal requirement. Safety audit report with compliance of recommendation is submitted to legal authorities. Join Safety Inspections (JSI) , HAZOP study, Chemical Risk Assessment (CRA) and Quantitative Risk Assessment (QRA) studies are also conducted at SPL at a regular interval. The recommendations of these studies and assessments are documented and conveyed to all concerned. Implementation status of the recommendations is reviewed periodically during meetings. Any deviations observed during the studies and inspections are reported to the HSE department and necessary actions are initiated.

Safety Awareness of employees is checked internally by developing HSE Quiz on Health Safety Environment Management Systems, Procedures and Practices. This question-answer set is distributed to all departments and also kept available on "SPL Intranet" portal for ready reference to all employees. The awareness is checked by HSE representatives by personal meeting at their work-spot as well as during Fire and Safety Drills. The best performers during this survey are awarded with certificate of appreciation and prizes during fire and safety campaign closing ceremony.

5. Special efforts and approaches to HSE and significant achievements

SPL has a full-fledged HSE Department with qualified and experienced HSE Professionals. Drivers / cleaners Training program on “safe transportation of dangerous goods by road” is conducted annually for ensuring safe transportation on the roads.

Hazardous Chemical Tanker Driver Training

For fresh graduates and technicians (GETs Graduate Engineering Trainee) and Diploma Engineers) a comprehensive HSE induction training Module is developed which includes basic HSE concepts, accident prevention, occupational health and hygiene, Plant Specific Fire Safety Systems, Procedures and Practices as well as Practical Training on Fire Protection, First Aid, Plant inspections and emergency preparedness and response. Evaluation of induction training is done by conducting written tests as well as verbal feedback. A special audio-visual training module has been designed for specialized training such as that of forklift operations, scaffolding, work permit system, hazardous chemical handling, hazardous waste transport and disposal, Risk Assessment, Safety Data Sheets etc.

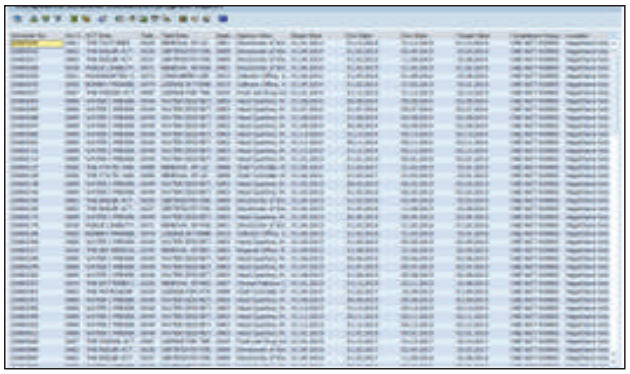
Induction training program for
Graduate Engineering Trainee

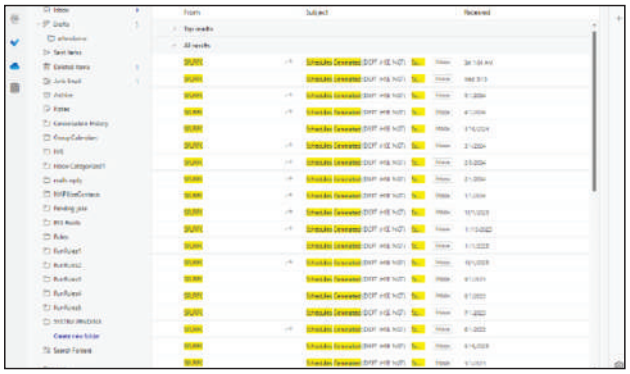
The management has been the key to develop a documented procedure for "Competence, Awareness and Training"- where frequency of HSE training to each and every employee is documented. The desired frequency of HSE training is once in a month (for SPL and Contract Employees). The training attendance record is maintained, and it is ensured that all employees attended the training program as per the desired frequency. The training modules are prepared by HSE as well as respective executive departments and same are implemented strictly. In case of absenteeism, additional special training batches are organized so as to ensure complete coverage.

SPL has a proven track record in its HSE performance which is evident from the fact that SPL has received various certifications and awards (88 nos.) including the prestigious Sarvashreshtha Suraksha Puraskar at National Level from National Safety Council of India, National Safety Award by Ministry of Labour, Govt. of India, National Safety Council Maharashtra Chapter's Safety Awards and Vasundhara Puraskar from Maharashtra Pollution Control Board and Environment Department, Govt. of Maharashtra, etc.

6. HSE management, its linkages with Key Result Areas and outcomes

At SPL, HSE performance is linked with every employee's performance appraisal. Also, HSE is an important part of the Company's business plans. HSE Management system includes various HSE key processes such as Compliance of Legal / Statutory requirements, identification of hazards, assessment of risk and risk controls, operation and maintenance of fire and safety equipment, occupational health surveillance, investigation of near miss, incidents & work injuries, emergency planning, preparedness and response, internal audits and inspections and HSE training. For the timely compliance of all applicable legal / statutory regulations, the company has developed system for Compliance Management System.





Compliance Management System

Outcomes

Maintaining aspect / hazard inventory register at departmental level for identification of aspect / hazards and its risk assessment from all routine and non-routine activities. Early detection of aspect / hazards from any missing activities and initiation of required risk controls. Also, internal and external issue register leads to improved understanding and awareness of the concept.

Internal Transportation System is developed for safe movement of vehicles. Implementation of Permit to Work System is done by incorporating important check points such as – necessity of risk assessment for non-routine activities, specific check points for temporary electrical connection, permit requiring confined spaces, Radiography permit and daily monitoring/ recording of work permits issued. This has improved permit issue system and safe execution of jobs. Introduction of Site-Specific Guidelines for Lone Work, Management of Change, and briefing to concerned operating personnel including contractors ensures uniform implementation of safe systems of work. Implementation of system for periodic review of adequacy of secondary containment ensures availability of secondary containment. Introduction of Site-Specific Guidelines for Hose Management and scaffolding resulted in uniform implementation of safe systems of work. Uniform implementation of safe systems of work is ensured by introduction of Site-Specific Guidelines for Internal Audits. Review of existing risk control measures and identification of frequency of failure for different equipment to improve the proactive approach towards incident prevention.

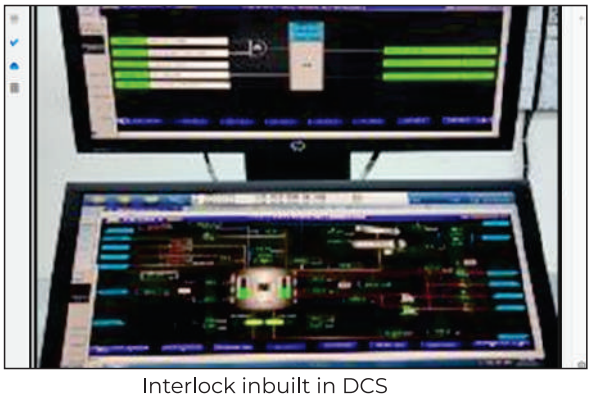
7. Use of advanced digital technology to Enhance HSE performance

Use of advanced digital technology has become an important element to improve the HSE performance of the Organization. At SPL, being a Major Accident Hazard unit, to reduce the risks, we continuously introduce advanced innovative technologies in our process operations & maintenance activities.

To control the hazards, we make use of following advance technology in our premises to improve our HSE performance:

- Hydrocarbon detection system installed at storage and process area is interlocked with fire water sprinkler system.
- Advanced interlocks are provided to hazardous material transfer pipelines with mass flow meter which detects possible leakage in the system.
- Safety interlocks are provided to inhibitor addition in raw material storage tank in case of abnormalities, i.e., initiation of reaction and rise in temperature.
- Emergency chain transfer agent auto charging system provided in the process in case of runaway reaction which can be remotely operated.
- Automation of bagging and palletizing system using Robot which has reduced risk associated with manual handling.
- The hydrocarbon detection systems provided at the flammable chemical storage and process plant which are interlocked with fire water sprinkler system can be operated from the DCS in the Control Room. The system is provided with Audio-Visual alarm.
- System for monitoring of earthing continuity with process interlocks to eliminate static charge hazard and associated risk of fire. Process shutdown is initiated after activation of interlock.
- Automation of Additive addition and Recycling systems at Plants that have resulted into reduction of risk and wastage.
- Replacement of multiple bag filters with single automatic multi-bag filters.
- Provision of earthing with interlock for unloading of Tankers carrying flammable chemical with indication on DCS.
- Runaway Reaction Control through Interlocks inbuilt in Distributed Control System (DCS) with full cool mode system. Process shutdown is initiated in case of runaway reaction.
- Provision of hydrocarbon detector at Air Handling Unit of finish goods warehouse with interlock in case of release of hydrocarbon linked with AHU exhaust ventilation blower.
- Use of flame detectors at various locations which detects flame in early stages of fire.

Automation of bagging system using robot



Interlock inbuilt in DCS

Dock Impact Barrier Air Blower & Spotlight Provision

Emergency chain transfer agent auto charging System

* * *

Safety Leadership, Policies & Practices at Kaiga Generating Station-3&4

(Manufacturing Sector- Group C- Sarvashreshtha Suraksha Puraskar – 2023 Award winner)

Vijayaravi Chandrakumar Sathi, Head (I&FS); K R Mohan Ram, ACE (S);
Rajesh Gopal Pathak, Chief Superintendent & Bachu Vinod Kumar, Station Director

Kaiga Generating Station - 3&4

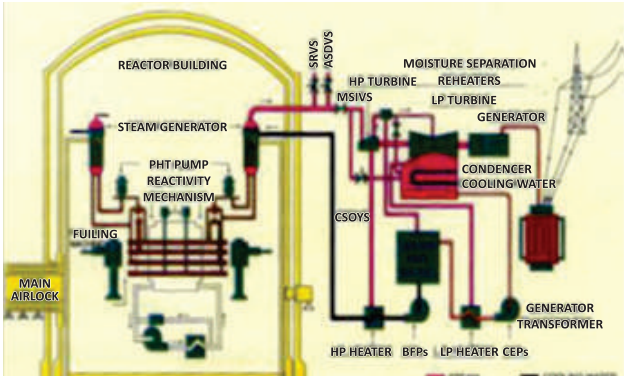
1. Introduction

Nuclear Power Corporation of India Limited (NPCIL). NPCIL is a Public Sector Enterprise under the administrative control of Department of Atomic Energy (DAE), Government of India having comprehensive capability in all facets of Nuclear Technology namely, Site Selection, Design, Construction, Commissioning, Operation, Maintenance, Renovation, Modernization, Plant Life Extension, Waste Management and Decommissioning, presently operates twenty two (22) reactors with a capacity of 8080 MW (excluding RAPS-1).The fleet comprises of 2 Boiling Water Reactors (BWRs), 2 Pressurized water reactors (PWRs) and 19 Pressurized Heavy Water Reactors (PHWRs), and has eight reactors with a capacity of 8200 MW under various stages of construction.

NPCIL has a cluster of four nuclear power plants each of 220 MW (e) capacity at Kaiga Site. Kaiga on the banks of River Kali in Uttara Kannada district of Karnataka in the Western Ghats of India. All the four units are operating safely and reliably supplying electricity to the southern grid. About 33% of the total power generated by Kaiga is utilised by Karnataka. Other beneficiary states are Telangana, Andhra Pradesh, Tamilnadu, Kerala and Puduchhery. The plant is being operated under the guidelines and regulations from Atomic Energy Regulatory Board (AERB). Kaiga Generating Station-3&4 is certified for ISO 14001:2015 Environment Management System, ISO 45001: 2018 Occupational Health and Safety Management System and ISO 9001:2015 Quality Management System by Bureau of Indian Standards (BIS).

2. Working principle of Nuclear power plant at Kaiga

Kaiga Generating Station -3&4 consists of two units of Pressurized Heavy Water Reactors (PHWR), each of 220 MWe capacity. They use natural uranium as fuel, and Heavy water as moderator and coolant. It consists of 306 horizontal pressure tube assemblies which contain the fuel bundles (12 bundles per pressure tube), through which pressurized heavy



water coolant circulates, are housed in a stainless steel vessel called Calandria. The pressure tube assemblies containing natural uranium fuel bundles are surrounded by heavy water moderator at near ambient pressure and temperature in the calandria. The calandria is supported at either ends End Shields. The calandria houses all reactivity and reactor shut down devices. The fuelling is carried out during the operation of the reactor by means of remotely operated fuelling machine. The heat produced by fission in the uranium bundles is transferred by the circulating heavy water to the light water (de-mineralized water) contained in the

secondary side of the steam generators to produce steam. This steam in-turn drives turbine which is coupled with the generator to produce electricity.

3. Human performance improvement

Implementation of multi-faceted and multi-pronged learning viz. assimilation of operating experiences, Just-in-time practices, performance based training, remedial training for repeat jobs & errors, improvement in field conditions to minimize human error likely situations have resulted in a paradigm shift in the human performance besides Mandatory training programs like Industrial Safety, Fire Safety, Radiological Safety, Heavy Water Handling, Station Protection Code, Security Awareness,. Specialised training for control room crew on simulator, control room team building has transpired to improve the work practices. The use of Nuclear Maintenance Application Centre Guide (NMAC), IAEA, COG and WANO documents have been successful tools to further augment the human performance. The training programmes are embedded with Foreign Material Exclusion (FME) principles. Elements of Management Systems like EMS – ISO 14001 and OHS – IS 18001, IS 9001 have also been incorporated in the training programmes. This has come a long way in improving optimal use of the resources, segregation of the wastes at source, minimization of waste generation, recycling of the wastes. Implementation of various measures in energy conservation has resulted in revenue gains for the station.

4. Safety Culture

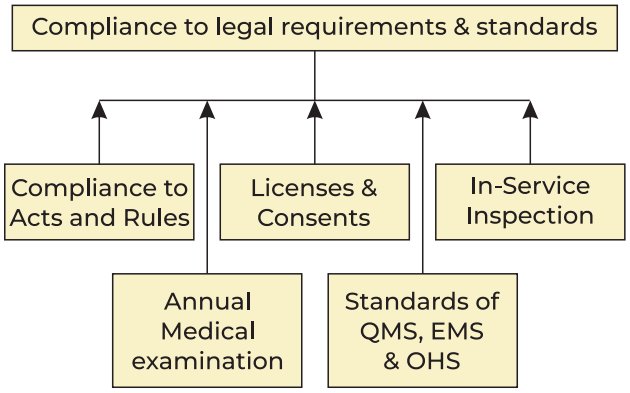
A good safety culture prevails at KGS in line with corporate safety policy & mission. Special emphasis is given on accident prevention, safety training programs and field surveys. Station recognizes safety functions as an overriding priority and encourages proactive involvement of safety professionals in monitoring and implementation of corrective action programme with participative rather than regulatory approach. The management expectations on safety culture is disseminated through continual training, periodic safety committee meetings at various levels. The concerted efforts of management, line managers and staff in unison have paid rich dividends by way of several awards and recognitions to the station from internal and external agencies. It is observed that the safety performance of the station is consistently improving by bringing down the frequency rate and severity rate to nil values.

There are no industrial accidents since December 2007 and the units are operating without a fire incident since March 2005.

Participation of workers is ensured through Sectional Level and Station Level Safety Committee meetings. There are sixteen sectional safety committees and a Station Level APEX Safety Committee. Representatives of Contract workers also included in the Sectional Safety Committee meetings. Industrial Safety & Fire related points are discussed & reviewed in the Station Level Apex Safety Committee meetings.

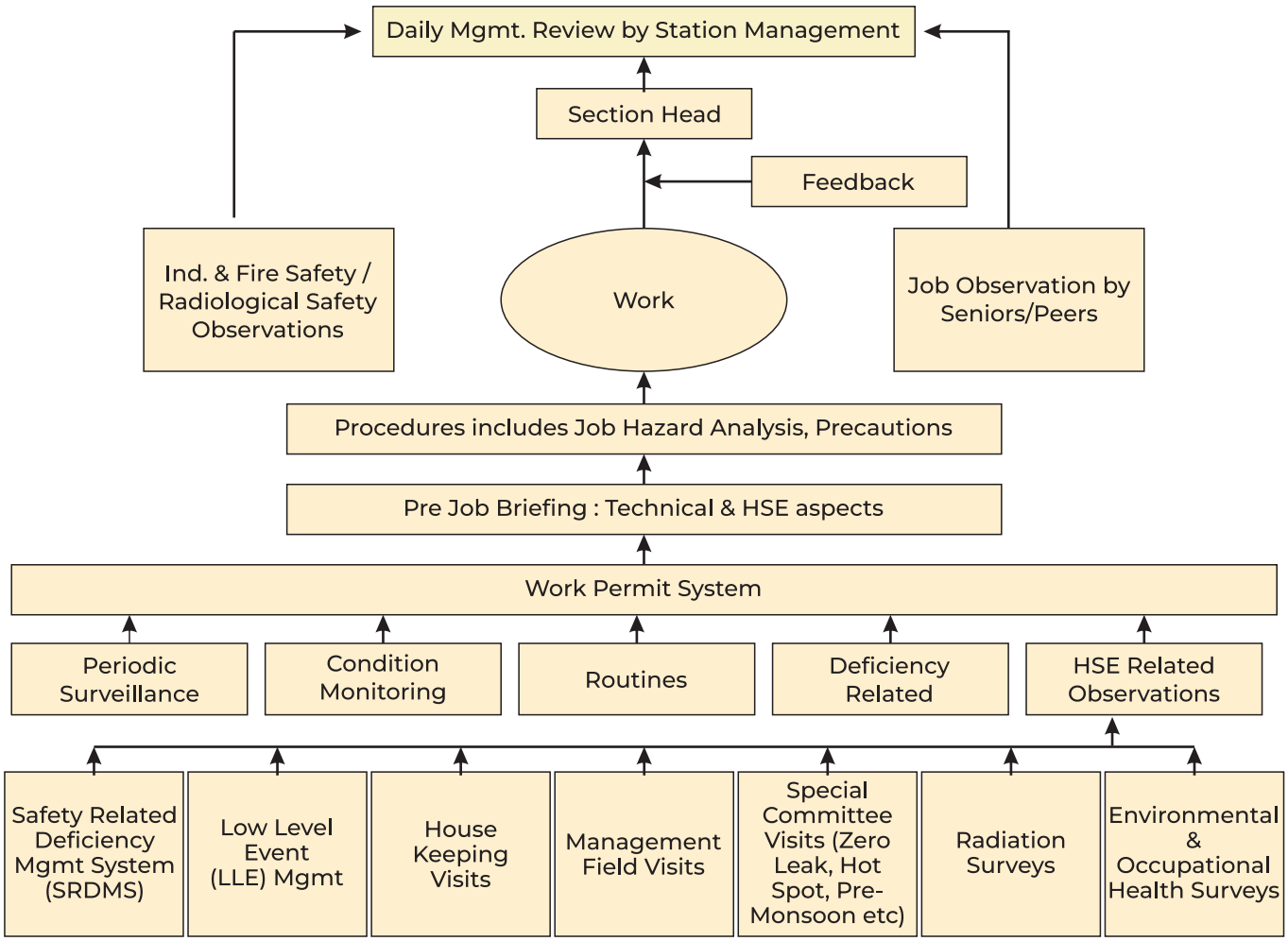
5. Legal requirements and its compliance:

All legal requirements are identified by station for compliance as applicable to various environmental aspects and Occupational Health and Safety hazards pertaining to station activities. Evaluation of compliance of the legal requirements and any change in legislation, regulation and other requirements are done periodically.



6. Management review of HSE management system

Parameters like collective dose, internal dose, cases of over-exposure exceeding prescribed limits, cases of personal contamination, incidents of heavy water spillages, on-power entries, effluent releases from the station are monitored regularly to identify areas for improvement in radiological safety. Process parameters and safety related issues are reviwed during daily meetings. Progress of daily work status is reviewed. Job observations by senior officers are also presented during daily review meetings. The meetings are attended by senior officers, section heads along with plant management.



7. Emergency Preparedness

Features in design as well as in operation of nuclear power plants make the occurrence of a severe reactor accident a very low probability event. In spite of this, as, as a prudent measure, plans exist for dealing with emergency situations involving large release of radioactive materials from the plant. Such plans envisage the participation of both the station authorities as well as the local administration (the latter for situations involving off-site emergencies). The following exercises are a part of the station emergency preparedness plan.

1. **Fire Emergency & Exercise**
2. **Chlorine Emergency & Exercise**
3. **Diesel Emergency & Exercise**
4. **Plant / Site Emergency Exercise**
5. **Off Site Emergency Exercise**

8. HSE Audits & Committees

1. Regulatory Inspections by Atomic Energy Regulatory Board:
2. Corporate Peer Review by in house team of NPCIL:
3. Corporate peer Review Follow-up Review:
4. Biennial Shut Down-Corporate Peer Review
5. Monsoon Survey and flood prevention committee
6. Fire Prevention Committee
7. Zero Leak Committee
8. Hot Spot Reduction Committee
9. Station Operations Review Committee
10. Operating Experience Review Committee
11. Root Cause Analysis Committee
12. Internal Audit for Integrated Management System

9. Special efforts and approaches to HSE and significant achievements

KGS-3&4 is operating the twin units by maintaining excellent track records in HSE front. Station has completed 5981 accident free days and 6993 fire free days as on 25th April 2024. Implementation of following HSE programs led to sustainability of accident free operation of the station and paved way for a strong safety culture.

Health Safety Environment Programs	
1	Housekeeping Inspection
2	Industrial Safety Permit and Hot Work Permits
3	Process Safety
4	Load testing of Material Handling Equipment
5	Authorization of Crane / Forklift operators
6	Job observation Program
7	Illumination & Noise Level Survey
8	Personal Protective Equipment (PPE)
9	Inspection of Power Tools & extension boards
10	Penalty for violation of safety rules
11	Scaffolding Inspection
12	Testing of electrical hand gloves

i) Housekeeping inspection by senior management:

There are 6 housekeeping inspection committees functioning at KGS 3&4. Each committee comprises of 5 -7 members. The committees are visiting whole plant areas on Tuesdays for inspecting housekeeping, fire safety aspects, occupational safety and environmental safety aspects of the station. Observations made during such visits are discussed in the daily meetings and deficiencies are followed up through the Low Level Event (LLE) Management System software. Trending and categorization of LLEs reported is done on quarterly basis.

ii) Industrial Safety Permit and Hot Work Permit System:

Safety of plant personnel and equipment is ensured by strictly adhering to safety permits and Safe Operating Procedures. At KGS-3&4 safety permits are available in electronic form. Safety permits are required for works like removal of hand rails, hatch blocks, work at height, hot works, electrical works and working in confined areas.

iii) Process Safety:

Licensing and qualification of operating and maintenance staff is done in order to ensure error free operation. Only qualified and authorized personnel are allowed to operate various process and systems of nuclear power stations. Class room training and field training is imparted prior to qualifying and licensing of employees. License will be issued by AERB by conducting qualification interviews.

iv) Job observation program:-

A dedicated team of senior engineers are observing jobs carried out in the station in routine manner. After conducting job observation, a presentation is made during daily meeting and findings are placed before the management. The following aspects are observed during job observation.

a) Pre job briefing
b) Procedural adherence
c) Adherence to Industrial Safety practices
d) Foreign Material Exclusion
e) Team work
f) Communication
g) Environmental condition
h) Error reduction technique
i) Post job debriefing
j) Human performance

v) Inspection of power tools and extension boards:-

Inspection of power tools is conducted on quarterly basis and tagging is done during such inspections. All extension boards and electrical tools used at plant premises are inspected by Safety Inspectors and certified for fitness.

vi) Illumination and Noise Level Survey:-

Illumination levels are checked at important areas and cross checked with AEFR (Atomic Energy Factories Rules 1996) standards. At KGS-3&4 Illumination Survey is carried out on monthly basis. Noise prone areas are monitored quarterly and employees exposed to noise level above 85 dBA are undergoing audiometric examination. Noise defenders / Ear muff Stations are installed at high noise areas.

vii) Personal Protective Equipment (PPE):

Wearing of Safety Helmet and Safety Shoes is made compulsory in all KGS-3&4 plant areas. All contract workmen are provided with safety shoes, double lanyard safety harness and safety helmets. Separate colour code is followed in the station for departmental and contract workers for wearing safety helmets.

viii) Inspection of Scaffoldings: 100% scaffold inspection program is introduced at KGS-3&4. Scaffold inspection is carried out whenever a scaffold is erected for work at height. Safety permits are issued prior to scaffold erection and the erected scaffolds are inspected by Industrial Safety staff. The scaffolds are certified to ensure safe work at heights as per approved station guidelines.

ix) Penalty clause in work order for violation of safety rules:

Provision is made in the work order for imposing penalty in case of violation of safety rules by contractors. Safety officer reports cases of violations to respective engineers in charge for imposing penalty.

x) Witnessing of load testing of material handling equipment's by safety staff:

All material handling equipment's in the station are load tested once in 12 months as per provision of the Atomic Energy Factories Rules 1996. Safety Officer or his representative, witness load testing of all material handling equipment's in the station.

xi) Crane/Forklift operation by authorized personnel:

Authorization is done for Fork Lift, Jumbo Truck, Crane operators and height work. Training passes are issued to employees after authorization. Safety training pass is given to all contract workers, after imparting safety training. Authorization committee under the Chairmanship of Maintenance Superintendent for operation of Crane/Forklift is existing at the station.

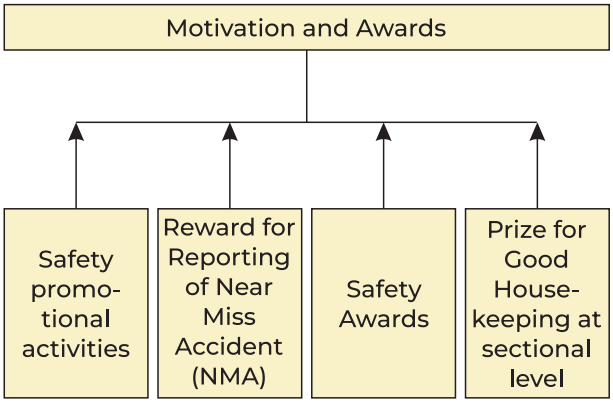
xii) Height work qualification structure:

Employees performing height work more than 2.5 mtrs are medically and physically qualified before deployment on works. Physical fitness is tested on height work qualification structure.

xiii) Testing of electrical hand gloves:

A test facility has been established for testing electrical hand gloves. All electrical hand gloves are tested once in 6 months frequency.

10. Motivation and Awards



To sustain the prevailing HSE culture in the station all employees are motivated for achieving high in the form of recognition and rewards.

a) Prize for Near Miss Accident (NMA) reporting for individual employees.

b) Housekeeping competitions among Sections and felicitation during celebration of National Safety Day.

c) Safety seminar titled "For the workers by the workers" conducted every year.

d) Competitions and felicitation of employees on National Safety Day, Fire Safety Day, World Environment Day, Energy Conservation Day and Productivity Day for departmental and contract employees, township residents, school children etc.

e) Nomination of workers to Shram Vir Purskar / NPCIL Performance Awards etc

f) Nomination of employees to external training programs conducted by National Safety Council of India, DGFASLI, Regional Labour Institutes etc.

g) Safety Awards for Departmental & Contract employees.

h) Safety Awards for Best Drivers.

i) Safety Competitions for Departmental & Contract employees.

j) Awareness campaign for Drivers on road safety by external agencies.

k) Invited talks by experts form National Safety Council of India and NSC Karnataka Chapter.

11. Corporate Social Responsibility, Public Awareness programme, Kaiga Nature Club and Environment Stewardship Programmes launched for the welfare of surrounding community& achievements

1. The mission of CSR activity is to contribute for community development by providing education, health care and infrastructure facilities to neighboring villages and up liftment of surrounding people.
2. The mission of Public Awareness Programme is to communicate, educate, enhance awareness and build relationship with public.
3. The Kaiga Nature Club is frequently conducting events such as monsoon cycle racing, boating through Kali River, trekking to nearby hillocks, special drive for eradication of plastics, Swach Bharat Abhiyan for cleaning nearby villages and township and bird watching.
4. Environment Stewardship Programme is initiated at KGS 3&4 to promote environment i.e flora and fauna, eco system, butterflies flowers, medicinal plants, shrubs, plants etc.

Inauguration of school building at GPLS, Nelepal, Mavinamane

Teachers training on vision test on 04.03.2024 at Kaiga Township

Following CSR activities carried out for the benefit of society.

1) Inauguration of school building at GPLS, Nelepal, Mavinamane.
2) Inauguration of School building at GHPS, Beegar.
3) Teachers training on vision test on 04.03.2024 at Kaiga Township.
4) Inauguration of ESL Building by Site Director Kaiga Site.
5) CSR Programme at Nage Devalmakki, Karwar.
6) Inauguration Road Bridge Taragar & Jogalkere L P S School building Village.
7) Inauguration of newly constructed Kitchen room and Dining hall at Mallapur village and concrete road at Shirve village.
8) Mid-day meal hall for Higher Primary schools in nearby village.
9) Distribution of high efficiency smoke less stove.
10) Bags/Uniform clothes & note books were distributed to all nearby schools.
11) Construction of dedicated Health Centre in nearby village for health care of villagers.
12) Surgery camp & Cataract screening for villagers.
13) Construction of halls at nearby villages.
14) Mobile Medial health unit at nearby village.
15) Transport facility for Government School children studying in nearby schools.

12. Safety Awards and Recognitions

1. KGS-3&4 has bagged many prestigious Safety Awards from various agencies like National Safety Council of India, NSC-Karnataka Chapter, Nuclear Power Corporation of India, Atomic Energy Regulatory Board and DGFASLI.
2. KGS#3&4 has bagged safety award from National Safety Council of India 12 times continuously for effective implementation of Occupational Health and Safety Management system.
3. KGS-3&4 has bagged safety awards from NSC-Karnataka Chapter every alternate years as this award is being bestowed on industries once in two years.
4. KGS-3&4 has received the most coveted NPCIL Safety Award 9 times in a row since 2014.

NSC Karnataka Chapter Safety Award
“Unnatha Suraksha Puraskara – 2023”

"Sarvashreshta Suraksha Puraskar" (Golden Trophy) 2023 from NSCI

Shri B Vinodkumar, Station Director is receiving Sarvashreshta Suraksha Puraskar-2023 from NSCI.

Shri B Vinodkumar, Station Director is receiving AERB Industrial Safety & Fire Safety Award - 2022

Shri B Vinodkumar, Station Director is receiving NPCIL Safety Award– 2022

Awards	Year
National Safety Council (NSC) of India	
Suraksha Puraskar (Bronze)	2012, 2013, 2021
Shrestha Suraksha Puraskar (Silver)	2014, 2015, 2019
Sarvashrestha Suraksha Puraskar (Gold)	2016, 2017, 2018, 2020, 2022, 2023
National Safety Council (NSC) Karnataka Chapter	
Utthama Suraksha Puraskara	2013, 2015
Unnatha Suraksha Puraskara	2017, 2019, 2021, 2023
NPCIL Safety Award	
NPCIL Safety Award (Winner)	2014, 2015, 2016, 2018,2019, 2020, 2021, 2022
NPCIL Safety Award (Runner up)	2017
AERB Award	
AERB Industrial Safety Award	2022
AERB Fire Safety Award	2022

12 Conclusion

Participation of all stake holders in HSE programs has yielded good returns as the station is operating for 5987 days of accident free days and 6999 days of fire free days as on 1st May 2024. KGS-3&4 has made an over whelming progress in safety front due to effective safety programs implemented by station management. The awards and accolades not only demonstrate results but an indicator towards strong leadership in Health and Safety practices.

* * *

India Tobacco Division of ITC Limited

Pune – Maharashtra

(Manufacturing Sector - Group E – Sarvashreshtha Suraksha Puraskar – 2023 Award Winner)

1. Background of the factory

The ITD Pune Cigarette Factory, a pivotal establishment within the India Tobacco Division of ITC Limited, represents the zenith of modern cigarette manufacturing. Inaugurated in 2010, this state-of-the-art facility is strategically situated in the industrious expanse of Ranjangaon MIDC, Shirur Taluka, Maharashtra, a mere 50 kilometers from the bustling metropolis of Pune. This factory is the embodiment of ITC Limited's commitment to innovation, safety, quality, and leadership in the tobacco industry.

The Pune factory is the culmination of ITC's extensive experience and leadership in the tobacco sector, boasting a countrywide distribution network that is unparalleled in its reach and efficiency. The factory's inception was a milestone, further cementing ITD's position as the industry vanguard in technology absorption and skilled workforce development. The facility's operations are a testament to the company's dedication to maintaining the highest standards of safety and hygiene, ensuring that every process, from the initial handling of unprocessed tobacco to the final packaging of cigarettes, adheres to stringent safety and quality control measures.

Equipped with cutting-edge technology, the Pune factory operates under rigorous Quality Control Standards that align with international benchmarks for cigarette production. The workforce, a cadre of meticulously trained professionals, is the driving force behind the factory's exceptional output and consistent quality. The General Manager, serving as the chief executive of the branch, oversees the seamless integration of advanced manufacturing techniques with the traditional art of cigarette crafting.

The ITD Pune Cigarette Factory's product portfolio includes a diverse range of cigarette brands, each manufactured to meet the discerning tastes of consumers while complying with environmental and health regulations. The factory's innovative approach to manufacturing has not only enhanced the efficiency of production but also significantly reduced the ecological footprint of its operations.

As the newest addition to ITD's manufacturing units, the Pune factory embodies the forward-thinking ethos of ITC Limited. It stands as a beacon of progress in the tobacco industry, continually pushing the boundaries of what is possible in cigarette manufacturing. The factory's success is a reflection of ITC's unwavering commitment to excellence, consumer satisfaction, and responsible corporate stewardship. It is this dedication that ensures the ITD Pune Cigarette Factory will continue to set industry benchmarks for years to come.

The ITD Pune Cigarette Factory, a beacon of ITC Limited's Tobacco Division, stands as a testament to the company's commitment to excellence and sustainability. Since its inception in 2010, the Pune factory has not only contributed significantly to ITC's stature as an industry leader in cigarette manufacturing but has also been a frontrunner in environmental health and safety (EHS) and sustainability. The factory's adherence to international quality control standards and its state-of-the-art technology are complemented by a series

of prestigious EHS and sustainability certifications. These include the ISO 14001 for Environmental Management Systems, ISO 45001 for Occupational Health & Safety Management Systems, and the SA 8000 for Social Accountability, underscoring the factory's dedication to operational excellence and employee welfare. Furthermore, the Pune factory has been recognized with a 5-star rating in Health and Safety Management by the British Safety Council and the Safety Innovation Award by the Institution of Engineers (India), highlighting its commitment to maintaining the highest EHS standards. The accolades also extend to energy efficiency, with the factory being lauded as an Excellent Energy Efficient Unit by the Confederation of Indian Industry (CII). These achievements reflect the factory's unwavering focus on sustainable practices and its role as a responsible corporate citizen in the global tobacco industry.

2. Top Management Commitment to EHS

ITC's India Tobacco Division Pune Factory is steadfast in its commitment to Environmental, Health, and Safety (EHS) standards, aligning with the company's overarching goal to ensure the greenest and safest operations. The Pune facility operates with a robust EHS policy that emphasizes minimizing environmental impact and fostering a positive ecological footprint. This commitment is evident in the factory's rigorous monitoring of resource usage, adherence to national and international benchmarks, and regular performance audits to enhance Safety, Environment, water, energy, and waste efficiencies. The factory's dedication to providing a safe and healthy workplace is reflected in its infrastructure, designed to exceed national legislation and match the best international standards. Furthermore, the Pune Factory actively engages in ITC's low carbon growth plan, utilizing around 48% of energy from renewable sources such as wind, and solar, and contributing to the company's significant carbon sequestration efforts through its Afforestation Programme.

The Board establishes the Environment Health & Safety (EHS) objectives, which guide the creation of the corporate strategy aimed at achieving these aims. Following this, each Division formulates its own plan, which informs the annual EHS strategy for each unit, ensuring alignment with the overarching corporate and divisional plans. The EHS goals and benchmarks stem from both internal and external considerations, are quantified, and matched with suitable indicators that reflect the comprehensive EHS Policy. The senior leadership of ITC & ITD is dedicated to integrating EHS considerations into all strategic planning and decision-making processes. The organization publicly shares its EHS performance and goals in its sustainability report, which adheres to the most recent Global Reporting Initiative Standards (GRI) and is accessible on its website. Moreover, the Senior Management has issued guidelines for environmental governance and ensured sufficient resources for environmental policy implementation. Ongoing environmental enhancements are achieved through regular evaluations of the aspect-impact for Operational Controls and Management Programs, setting objectives and targets across all departments and levels.

At the ITC Ranjangaon factory, the top management integrates safety considerations into the business strategy through various methods, following a structure that begins with the EHS Policy, progresses to the EHS System, and culminates in a culture driven by EHS values. At ITD Ranjangaon, a top-down approach to safety is championed, starting with the EHS policy and extending through systems and culture, led by the General Manager and supported throughout the organization, from department

heads to external contractors.

I. Implementing ITC EHS Policy & Establishing Defined EHS Goals:

At ITD Ranjangaon, we set safety objectives that are in harmony with the company's broader mission and vision. Unit sets safety objectives in line with the company's overarching goals. At the beginning of each year, the Divisional Management Committee underscores the significance of safety. The senior leadership evaluates the objectives for the EHS and sustainability plan, deliberating on the upcoming year's initiatives. Through regular monthly meetings, unit leaders assess the EHS and sustainability outcomes, focusing on areas such as training, goals, adherence to legal standards, and the execution of remedial measures following plant inspections and internal audits.

3. Employees Participation and involvement in EHS Matter

Embedding Safety in Core Values

Our establishment adheres to the EHS guidelines set by ITC and the directives of the Factories Act of 1948, forming EHS committees that encompass representatives from both management and the workforce. The Factory Head leads the Central EHS Committee, which includes an equal representation of management and staff, with the responsibility of enacting the EHS policy at the unit level through quarterly meetings. These meetings are scheduled in advance, with recorded attendance and disseminated minutes to ensure transparency and public knowledge. Similarly, the Departmental EHS meetings, presided over by the Department Head, engage supervisors and staff members to deliberate on EHS matters and expedite resolutions to previously raised issues.

Our commitment to EHS goes beyond the obligatory gatherings, fostering a culture of proactive engagement throughout the facility. The Hazard Spotting program encourages staff to identify and report potential risks using either a paper form or a digital application equipped with QR codes, thus enabling timely intervention and preventive action. This opportunity is also extended to visitors, allowing them to contribute to our safety efforts. All submissions are meticulously evaluated, and the efficacy of the resultant actions is thoroughly verified.

At ITD Ranjangaon, safety is woven into the very fabric of our organizational ethos and daily practices, nurturing an atmosphere where every employee, from the ground up, is acutely aware of and committed to safety. Our adherence to a Behavioural-based Safety System (BBS) is complemented by thorough safety culture evaluations, encompassing educational programs, consistent scrutiny via Management Review meetings (MRM), and targeted initiatives like 'SUSA'. Such a strategy guarantees the elevation and consistent application of safety measures across the board.

In addition, we observe significant safety-related events such as National Safety Day and World Environment Day, as well as Electrical Safety Week and Fire Services Day, engaging our plant's vast employee base in these observances. We celebrate the dedication, involvement, and proactive involvement of our workforce and service providers. Regular assessment of the safety culture is imperative for measuring an organization's dedication to maintaining a secure workplace. This evaluation is instrumental in identifying potential safety risks and enacting preventative strategies to protect both our facilities and personnel. Prioritizing compliance with safety standards not only fulfills legal obligations but also bolsters operational efficiency and curtails costs related to business activities.

Establishing Safety Metrics: The Division sets up critical safety-oriented key performance indicators (KPIs), encompassing proactive assessments such as Unsafe Acts, Unsafe Conditions, SUSA (Safe and Unsafe Acts), Safety Suggestions, Scheduled Planned Job Observations, and EHS (Environmental, Health, and Safety) training initiatives. These KPIs undergo regular scrutiny to assess progress and identify areas for improvement. The General Manager oversees the monthly Business Performance Review (BPR) sessions, during which these KPIs are thoroughly examined. Specialized teams are tasked with the management of these KPIs to enhance their influence and effectiveness.

Blood donation camp with Distribution of Full-Face Riders Helmet to Each Donor

Work Station & Canopy problem solving Safety activities on Behaviour, 5s, office ergonomics.

Online Gaming Safety Quiz on Mobiles and laptops During National Safety Month

World Environment Day Celebration by planting 250 trees at MIDC Area. Distribution of Jute bags to all employees during

Nukkad Natak on Home Safety, Electrical Safety, Road Safety during Family Function

Session on Aids Awareness b Company Doctor during World Aids Day.

Mental Stress and Fatigue Management Training During Road Safety Month for Operators and Drivers.

CEHS Committee members taking shop floor EHS

Risk Assessment by Managers to
shop floor employees

Cross-functional Teams (CFT) Collaboration for EHS Audits, Inspections

The unit promotes interdepartmental cooperation, involving teams from operations, maintenance, security, and human resources, to conduct risk management and embed safety measures into different business facets. It has equipped internal auditors with training from accredited bodies like DNV, NFPA, LPA, etc. These skilled individuals, including employees and managers, are tasked with executing departmental and process-specific EHS audits regularly, following a timetable approved by the General Manager.

Training & Education, Rewards & Recognition:

This department is committed to the continuous provision of educational and training initiatives for all staff tiers, with the objective of enhancing safety awareness and adherence to established safety standards and protocols. A detailed training framework is in place, pinpointing the exact training requisites, encompassing EHS Orientation, EHS Refresher Courses, Practical EHS Training, Fire Hazard Training, Electrical Hazard Prevention, Traffic Safety, Safety Beyond the Workplace, Domestic Safety Education (inclusive of LPG handling), Emergency First Response, Introduction to Emerging Technologies, and updates on new safety regulations. In parallel, the department implements a system of rewards and recognition to honor staff members who make significant contributions in areas such as continuous improvement (kaizen), workplace organization (5S), maintenance of premises, and proposing safety enhancements

Rewards and Recognition for
Best Safety Suggestions Hazard and Hunt Team
Housekeeping & 5S Competition
Best Safety Stories

Safety Training at ITD Pune team in action

Employee engage in
Extinguishing Fire

First Aider engaged in
rescuing the victim

Fire Hydrant
Operation Training

Off the Job
Safety Program

Trained Fire Fighter engage
in Extinguishing Fire

Cleaning Equipment
(Machine) Training

Extinguisher Operation
Training

MHE Safety Training by OEM
Engineer (Genie, GR-20)

Induction training program for
Graduate Engineering Trainee

4. Implementation of the recommendations of studies, audits, committees, etc.

At the ITD Ranjangaon facility, we've established a robust and all-encompassing safety audit system that ensures our commitment to continual enhancement, fostering a safer plant environment, a healthier workforce, and eco-friendly products. Biannual internal audits are conducted in alignment with the ISO 14001/45001 standards for Environmental Management and Occupational Health & Safety. The management representative proactively disseminates the audit agenda and timetable to all Heads of Department. Accompanying this, a summary of audit coverage, responsibilities, and deadlines is distributed and subsequently reviewed in the ISO MR Review meetings. Following the departmental resolution of audit points, the internal auditor collaborates with the respective department to confirm the effectiveness of the actions taken. In addition, bi-monthly internal EHS Audits are performed in accordance with ITC Corporate EHS protocols by a multidisciplinary team comprising Department managers and Engineering personnel. These audits are organized via ITC's digital inspection tool, ensuring a systematic approach. Findings from these audits are compiled and addressed prior to the corporate audit. Moreover, the Unit facility regularly conducts a Fire safety audit on a monthly basis, overseen by the security team.

Additionally, audits spanning across different units are conducted every quarter. In conclusion, an annual audit is performed by the Corporate Environmental, Health, and Safety (EHS) team. This process is executed by a cadre of skilled and certified auditors. Scores from these audits are assigned based on the corporate EHS standards. The resulting action plan is then examined during the Central Safety Committee Meeting and the findings are communicated back to the Corporate EHS on a quarterly basis. Here, we showcase some of the enacted suggestions from the audits and committees for illustrative purposes:-

1. Improvement in Risk assessment System by incorporating Residual risk which is done in Gensuite EHS Digital application accordingly risk assessment of all areas has been incorporated in Application with residual Risk.
2. Quarterly EHS bulletin on EHS to make all employees aware on EHS related updates and what unit specifically doing on various EHS parameter including initiatives.
3. Engaging employees on EHS subject through further strengthening toolbox meetings and on-the-job training on emergency handling equipment.
4. Post assessment system strengthening through online e- learning modules on EHS training.
5. Systems strengthening to improve reporting of near miss incidents through various communication forums.
6. Incorporating EHS requirements and assessment during recruitment process at unit level
7. Improving workplace ergonomics by conducting ergonomic study through experts and taking actions accordingly
8. Incorporation of Stress management in Periodic medical examination of all employees and strengthening programs and initiatives for the physical fitness of employees.
9. Improvement in secondary containment for Diesel Day tanks for DG sets.
10. Strengthening EHS Inspections of Portable tools and developing a system of proper tagging.
11. Project area Safety improvements through system of Inspections, Training and Risk assessment.
12. Improvement in Labeling of Equipment's like air receivers, MHEs, pipelines. (reflective tape in al MHE).
13. Use of AI Based cameras for MHE for pedestrian detection and use of Bio metric access control of MHE
14. Strengthening of Vehicle Safety by incorporating vehicle checklist at Material gate.

15 Emergency switches provided with standard sticker.

16 Pressure Gauge changed and optimum range marked.

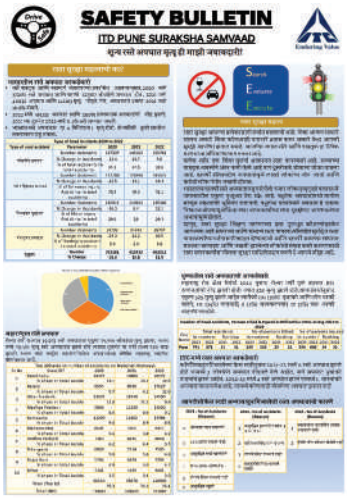
17 SCBA (Self Contained Breathing Apparatus) video and training ensured.

18 All Eyewash station provided with auto opening of dust flaps during use, same is incorporated in the inspection checklist.

19 Confined space identification signage improvement done,

20 Unit had incorporated Safe tag system for scaffolding and unit have now 4 certified and trained scaffolding inspectors at site.

Snaps of implementation post EHS Audits



All MHE marking with reflective take and SWL

SWP labelling of all pressure vessels

All area with pipelines above floor covered with flat surface and hazard marking done.

All Emergency stop switch with proper labelling done

SCABA Training by OEM to Core Emergency Team

All pipelines provided with Directional arrows.

All confined spaces identified with proper signage displayed.

All eyewash station provided with dust flaps to prevent clogging of nozzles

Day tank Dyke Volume increase to contain all spillage in case of failure

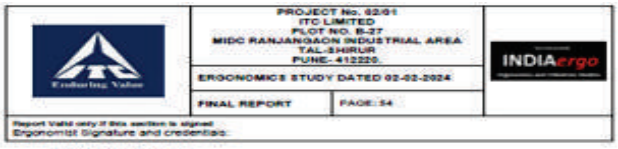
System of Inspection and tagging of Scaffolds for safe Use.

System of Inspection of all emergency handling, PPES portable equipment with QR code and tagging.

5. Special efforts and approaches to SHE and significant achievements (tangible and non-tangible);

ITD Ranjangaon has made significant investments in cutting-edge systems to ensure workplace safety and security, aligning with our Environmental, Health, and Safety (EHS) goals and the ongoing pursuit of excellence. These state-of-the-art measures reflect our commitment to fostering a protective environment for our employees while continuously enhancing our operational standards. Through these advancements, we demonstrate our dedication to not only meeting but exceeding industry benchmarks for safety and continuous improvement

Snaps of implementation post EHS Audits

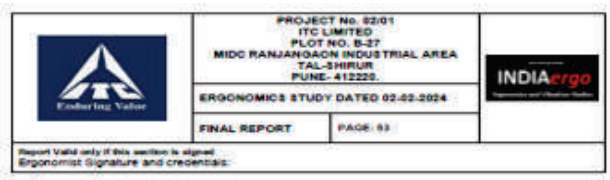

PROJECT No. 02/01
ITC LIMITED
PLOT NO. B-27
MIDC RANJANGAON INDUSTRIAL AREA
TAL-SHIRUR
PUNE- 412220.
ERGONOMICS STUDY DATED 02-02-2024
FINAL REPORT
PAGE: 54
Report Valid only if this section is signed
Ergonomist Signature and credentials:

5.8 Quality Lab

Figure 5-8 Quality Lab

REBA: 2
The employee is required to test the material for its quality.
The employee is required to stand for about 30-45 minutes during each testing. Out of these 5-10 minutes are spent entering test findings in the PC. Employee does on an average 3-4 tests in a day.
The task is assessed using the REBA scale. REBA score of 2 indicates 'low risk, change may be needed'.

1 TASK CYCLE: 6-8 hours.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ERGONOMICS STUDY DATED 02-02-2024
FINAL REPORT
PAGE: 53
Report Valid only if this section is signed
Ergonomist Signature and credentials:

5.7 Strapping Machine

Figure 5-7 Strapping Machine

LUX: 93 dBA:59 HUMIDITY:58 TEMPERATURE:28

The employee is required to monitor the strapping line and intermittently intervene only if there is an issue with automated process and the boxes stop moving on the line.

1 TASK CYCLE: 6-8 hours.
2 EMPLOYEE FEEDBACK: No complaints
3 EVALUATION OF RISKS: Employee is in a supervisory role and there is no significant manual activity warranting any ergonomic intervention.
4 ERGONOMICS RECOMMENDATIONS:
a) No significant change is required for this task.

Work place Ergonomics Improvement- Ergonomic study based on ISO standard Introduction of Drum Handling Trolley based on Ergonomic study report

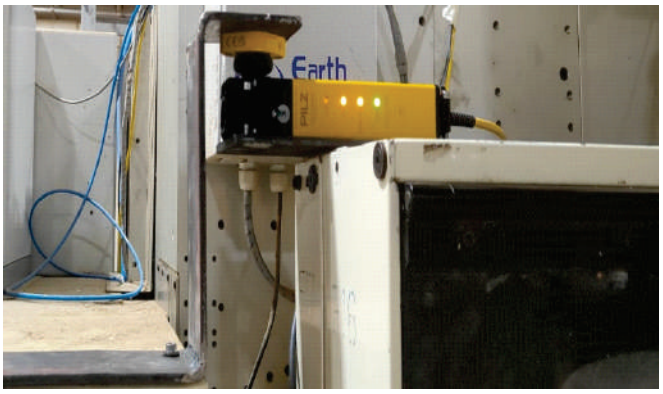
Strengthening of Emergency Preparedness Response Provisions at Site

AED : designed to provide Immediate medical aid in Golden Hours till Victim reaches Hospital.

Scoop Stretcher: safely transferring an injured person without exacerbating the injury

Emergency Evacuation Chair:
For safe stairway exit of the disabled, pregnant, or injured.

Safety mat for the strapping machine:
seamless integration to operations | restrict access during operation



GDX6 : Dead man's Switch | RFID – Coded safety Interlocks
prevent override | control supervision are maintained during troubleshooting

Working at Height Safety Improvement

CEHS Approved Standard Scaffolding with Safety Tags
with Trained and certified Scaffolding erector (30) and Inspector (4)

Implemented lifeline system in Scrap Yard, WMS Scrap, LG Dock, and OCM Dock.

6. SHE management, its linkages with Key Result Areas and outcomes;

The Chief Executive Officer (CEO) of the company holds the responsibility for the creation, execution, maintenance, and continuous improvement of the Environmental, Health, and Safety (EHS) Management Systems, as well as the Health, Safety, and Environment (HSE) Policy within ITC Limited. This includes:

1. Delegating duties and responsibilities to the Factory Manager at the factory level.
2. The Factory Manager leads the Unit EHS Organization and is responsible for the creation, execution, maintenance, and continuous improvement of the EHS Management System and HSE Policy within their respective factory.
3. Subsequently, the Factory Manager distributes EHS responsibilities across all levels of the organization through a formal written document, which encompasses:
   a. Every department within the organization.
   b. Members of the Central EHS Committee.
   c. Members of the Emergency Response Team.

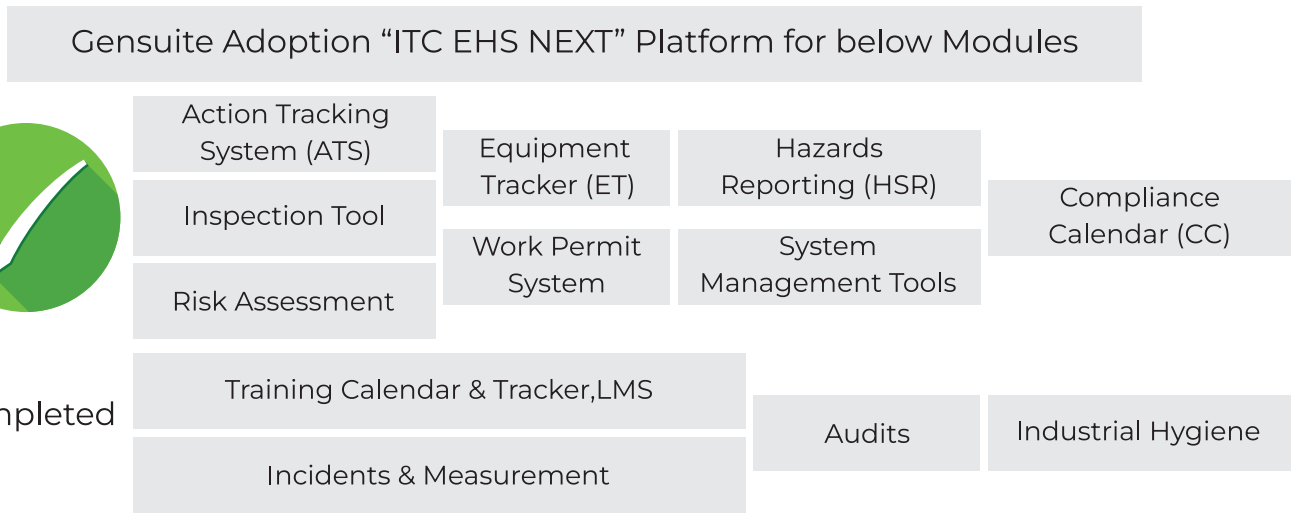
This structured approach ensures a clear chain of command and accountability within the company's EHS framework.

In ITC, Environmental Health and Safety (EHS) is integral to the Key Result Areas (KRA) for all Line Managers. The initiative is propelled by these managers while receiving support from the EHS department. Adhering to the standards of QMS, EMS, OHSAS, SA8000, and ITC's own EHS protocols, each department has established comprehensive procedures to fulfill EHS goals. Specific EHS duties are designated to line managers, who, at the onset of every fiscal year, review and consent to these responsibilities. Subsequently, they devise a strategic plan to carry out EHS-related tasks, which includes:

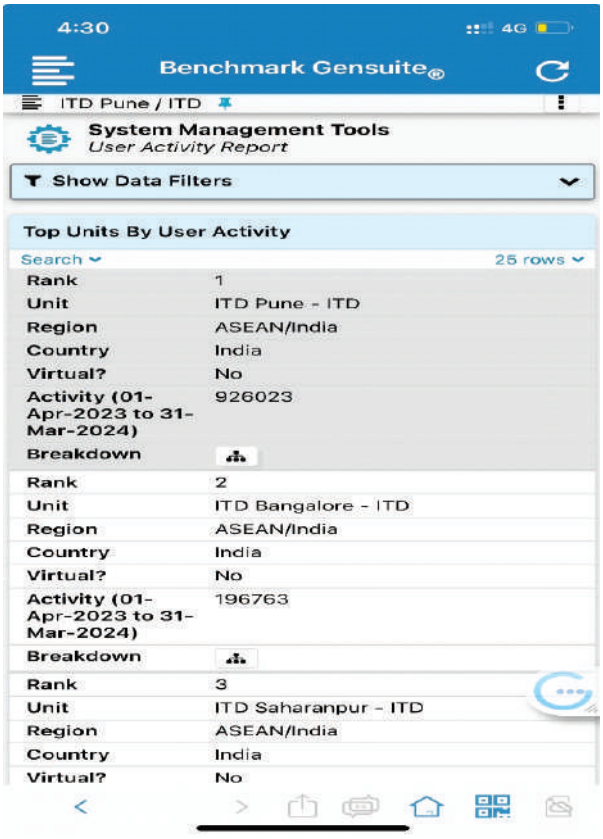
- Encouraging employee engagement in proposing safety improvements,
- Conducting hazard identification tours,
- Participating in risk assessment and mitigation,
- Evaluating and addressing environmental impacts,
- Ensuring remedial measures for critical risks and environmental concerns,
- Disseminating EHS aims to the workforce,
- And regularly inspecting safety equipment and maintaining pertinent documentation.

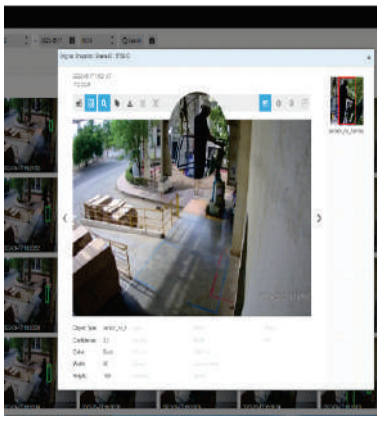
7. Use of advanced digital technology (AI, AR/VR, Robotics, Drone etc.) to enhance safety.

ITD Ranjangaon is advancing on a digital trajectory in harmony with the ITC Chairman's blueprint for the ITC Next Strategy. The EHS sector has been fully integrated into this initiative. An all-encompassing digital platform has been established named as ITC EHS NEXT Platform, actively engaging all employees to pinpoint potential hazards and offer suggestions within the manufacturing zone. These identified risks or proposals are then forwarded to the designated supervisors for both corrective and preventive measures through the same digital system. Upon addressing the identified risks, updates are made on the platform, and the individual who reported the hazard receives a notification about the resolution.



- The Dashboard provides visibility for all logged hazards and recommendations, which are ultimately assessed by the EHS manager. The process of hazard identification and the status of subsequent actions are regular topics in senior review meetings, ensuring that corrective measures are implemented and validated. Apart from Hazard and Suggestion reporting on Digital Platform
- Incorporated Equipment EHS related Inspection by simply scanning the QR code on the equipment and doing Inspection.
- Started training of Employees through e-learning modules on this platform
- Started use of Digital tool for Trend analysis of data w.r.t EHS Inspections, Hazards and suggestion reported, Near miss incidents, Incident investigation and training plan accordingly.
- Incorporated Industrial Hygiene Inspections like – Ventilation survey, Illumination Survey, Work zone dust monitoring on Gensuite EHS Platform and follow up systems.
- Incorporated EHS Training Tracker and training calendar and logging of Training in EHS Gensuite application.
- Made Multi Gas Detector with motion sensors and real time emergency alert at Emergency control room.
- Work permit Issuing through online platform.
- Incorporated CCTV Video analytics for EHS related violation real time monitoring and alert generation to person doing violation w.r.t Height Safety, PPES usage, aisles blocking, Operating machine without guard, Fire detection etc.
- Evaluated MHE's for Increased safety, and Installed of Biometric sensors, Visual flashers for increased alert etc., Wireless Fork view camera for Rack placement of load for MHEs and AI based Pedestrian detection at the rear of MHE and generating alarm to the operator.





Location Covered : Lamina Feed, LG Dock, LG Store.

Application Coverage for used cases: -

Lamina Feed:-

Cell phone detection, Hand gloves, MHE approaching Person.

LG Dock:

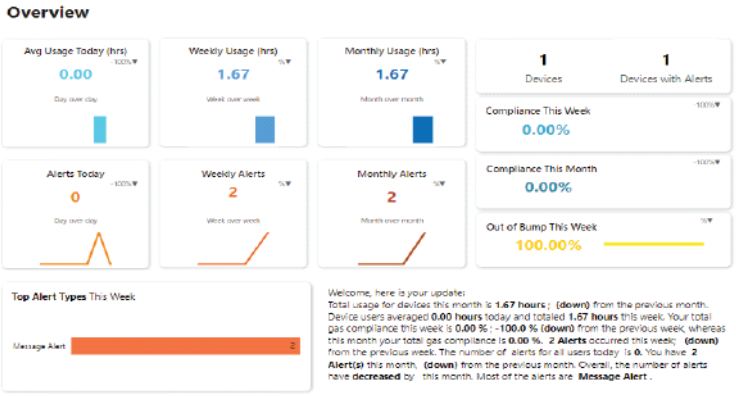
Use of Helmet, Safety Harness, Wheel Chock under the vehicle.

LG Store:

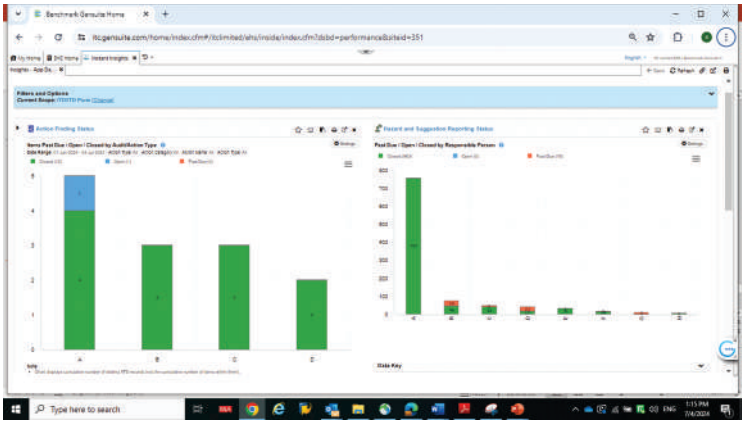
Aisle not blocked, Fire Detection.

Biometric Access control and Wireless fork view cameras for MHEs

Use of IoT for Workplace activity – Confined Space Safety and Working at Height Safety, Lone working



Multi Gas Detector with Cellular network connected with **real time monitoring**



EHS Module yearly Dashboard on EHS system related Compliance

The ITD Ranjangaon facility has not only installed a 700KWp Solar Power Plant but is also in the process of adding an additional 2 MW rooftop solar installation to align with the ambitious goals of the Sustainability 2.0 framework by ITC. This framework aims for a complete transition to renewable electrical energy and a 50% cut in Greenhouse Gas emissions from the levels of 2018-19 by the mid-21st century.

The Ranjangaon facility is committed to generating value for all stakeholders, staying true to ITC's core principle of putting the Nation First. In line with ITC's Mission Sunehra Kal, the plant has initiated the scientific management of local waste, with community involvement, to significantly reduce landfill use, enhance cleanliness and hygiene in the surrounding areas, ensure thorough segregation at the source, and repurpose waste as a valuable resource.

The Ranjangaon facility of ITD has consistently been at the forefront of achieving the company's Environmental, Health, and Safety (EHS) goals, maintaining a dynamic approach. Our commitment is unwavering in our continuous endeavour to innovate customer-centric products, ensuring excellence in performance, and generating value for every stakeholder. This dedication aligns with our expansive vision of "SabSathBadhein."

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Shree Ram Mandir Project Ayodhya:

A Landmark of Safety and Excellence

(Construction Sector – Group A – Sarvashreshtha Suraksha Puraskar – 2023 Award)

1. Background

The creation of the Shree Ramjanmbhoomi Mandir in Ayodhya stands as a monumental achievement, reflecting the intricate blend of cultural heritage, engineering prowess, and stringent safety protocols. This project, awarded the prestigious Gold Award by the National Safety Council, underscores the unwavering commitment to safety and excellence in construction.

L&T Construction, through its Buildings & Factories IC, was awarded the contract for this prestigious project. L&T, a $27 billion Indian multinational, is renowned for its EPC projects, hi-tech manufacturing, and services across over 50 countries. With a strong customer-focused approach and relentless pursuit of top-quality standards, L&T has maintained leadership in its core business areas for decades.

2. A Home for Lord Rama:

On January 22, 2024, the nation watched in awe as Prime Minister Shri Narendra Modi perform the pranpratishthapna ceremony of the Shree Ramjanmbhoomi Mandir. This moment marked not only a civilizational milestone for India but also celebrated the extraordinary efforts of those behind its construction. The journey to build the iconic Ram Janmabhoomi Mandir has been a testament to the perseverance, dedication, and precision of our workforce, showcasing meticulous craftsmanship and adherence to the highest safety standards. Overcoming numerous challenges, we have realized a timeless symbol of Indian heritage that is built to last a millennium.

The Shree Ramjanmbhoomi Mandir Project is situated at Ramkot Ayodhya (UP), approximately 1 km from Ayodhya Dham railway station and 145 km from Lucknow. The project encompasses the construction of the Shree Ram Temple & Parkota (rectangular wall) and Allied infrastructure within an 70-acre complex.

3. Opening ceremony

- Nearly 8000 Rambhakta were gathered during pranpratishthapna on 22nd January by Hon. PM Mr. Narendra Modi Jee. All peoples belong to religious

leaders, Film Start, Well known industrialist, Politicians & other community of India. Prime Minister showering flowers on all staff & workmen for their dedication for constricting Shri Ramjanmbhoomi without Lost Time injury with highest safety standard

- We also created big platform of scaffolding for the sitting arrangement of all invited guest for the ceremony with load test calculation

Project details:

The initial task involved excavation up to 14 feet, completed within three months starting January 2021. Given the structure's need to endure for a millennium, traditional steel reinforcement was eschewed. Instead, a multilayer foundation was created using engineered fill comprising sand, aggregate, and a minor amount of cement. A robust 6,300-sq-m concrete raft, made of high-strength M35 grade plain cement concrete, forms the foundation, supporting a 6.3-meter-high plinth structure constructed from 27,000 interlocking granite stones.

The temple consists of three floors, featuring five mandapams and a 161-foot-tall Shikhar. It is adorned with 392 pillars and over 10,000 iconography idols and sculptures, utilizing 474,806 cubic feet of sandstone from the Bansipaharpur mine in Rajasthan.

4 Safety Excellence :

Our mission to achieve zero harm is at the forefront of our operations. This commitment is led by our dedicated leadership and embraced by every individual involved in the project.

5 Integrated EHS Approach:

Our Environmental, Health, and Safety (EHS) approach is integrated into every aspect of the project and business process. From detailed risk assessments and method statements to continuous monitoring and evaluation, we ensure compliance with all safety standards and regulations. Meticulous planning is done to ensure that all the safety aspects are considered before starting any new activities. For example, in the Granite stones installation, key stakeholders were discussed in detail on the transportation arrangements, handling of stones, matching the stones, with QR codes and erection & alignment to ensure safety in these activities. A similar approach was followed for all the activities.

Safety aspects are integrated with individual functions such as,

- P&M – safety consideration in hiring or bringing any equipment and its safe operations on the maintenance and inspections
- Formwork & Scaffold system – Incorporation of safety aspects in a scheme such as access, fall protection arrangement, stability, etc.,
- Procurement – EHS consideration in subcontractor management and procurement of any materials.
- Execution – simplified assessment with pre-job checks, hazard communication integrated with pre-briefing, monitoring and reporting of safety achievements along with progress monitoring, etc.,

6 Commitment to Excellence:

Leadership and commitment to safety are demonstrated through various initiatives, including safety awareness campaigns, competitions, and recognition programs. Our top management's dedication to EHS is evident in their active involvement and the implementation of rigorous safety protocols.

Everyone is bound to follow the company's EHS policy, which is well communicated during safety Induction to all stakeholders. Our CMD, Mr S N Subrahman an led various initiatives, which aved

the path to a healthy safety culture at the project site. The following quote from his Desk is self-understood.

"SAFETY & ETHICS are the "License" to do Business.

There are various initiatives to demonstrate visible leadership & commitment including executive safety audit by seniors during the site visit, "we belong to EHS- Green helmet by executive Heads "- participation of site leaders with green helmets during walkdown, setting personal EHS objectives by the senior leaders, starts the meetings with safety, chairing the safety review meetings, etc.,

- **Unique Construction Methodology:** Unlike conventional RCC structures, this project used massive granite stones placed in a zigzag manner for stability and longevity. Granite stone of different sizes 1.2x600x900 mm (approx. Weight 2.8 T) procured and placed during construction of this project. All these stones were transported approximately 1800 km (about 1118.47 mi) form different places across India by 3 different modes viz. Railways & Roadways & in containers.
- **Fall Protection:** L&T has a standard operational

control for fall protection such as a catch net and edge protection system. However, it was so challenging anchor fasteners for modular edge protection and protruded rods in RCC with pipe barricade with fixed/ swivel couplers were not possible in stones, unlike the RCC structure. An alternative anchoring mechanism such as soft anchor fasteners for fixing stones and support from scaffolding, etc., was explored to ensure the protection system meets international standards. For this, we drilled 80 mm depth holes in stone & inserted 32 mm steel rebar with NB40 pipe for vertical support & horizontally tied with a swivel coupler for hard barricading to the entire periphery lower plinth. After Sandstone installations we did the same thing with vertical full-length pipe with diagonal support at height.

- **Scaffolding:** Erecting a massive scaffolding for various works around an RCC structure is an easier task but it's not so for this project. A scaffold was required in many places around the temple to enable sandstone installation. However, ties from a permanent structure were merely an impossible task. It was managed with a detailed discussion with the Scaffolding cell and construction methodology planning cell.

  For the erection of scaffolding for carving & installation of carved stones of various sizes & shape, we take help from the construction methodology planning cell (CMPC) for erecting a working platform which gives a positive message to the workmen & they feel comfortable working at the height

- **Handling Carved Stones:** For any lifting, it is crucial to identify lifting points based on the centre of gravity and accordingly, the nylon slings can be attached too for handling. The scenario is completely cumbersome as the carved stones are of different sizes & delicate in shape and many precautions to prevent damage to the carved portion while lifting. Best-in-class and experienced manufacturers of web slings and Subject Matter experts on lifting have been called for to discuss these issues. A unique web sling has been made for lifting these sorts of delicate carved stones.

- **Power Tools and Dust Control:** Over 300 power tools were used, necessitating advanced dust control measures and wet grinding to maintain a safe working environment.
- **Security and Coordination:** It was completely a different scenario working on this project as more than 3000 armed guards surrounded our project always. There are multiple layers of security protection at the project viz. from the UP Police to Commando Force.

  Due to security reasons, ten days advance notification with details of Aadhar and other details to be submitted to the authorities for background verification. Deployment can be processed only after getting confirmation from the concerned authority. So meticulous planning was in place to mobilize the team to complete the work on time.

  A similar process is being followed for bringing any visitors or vendors to the project for any discussion and product sampling.
- **Traffic and Crowd Management:** Effective traffic management plans and crowd control measures were implemented to handle the influx of visitors and ensure uninterrupted construction progress.
- **Safety Culture:** Most of the workmen and sculptures deployed in the project were from different work safety cultures as they had never been exposed to Personal Protective Equipment (PPE) and the practices of L&T. It is a real challenge to adapt them to use the PPE appropriately and upbringing their culture to align with the current safety standards.
- Other challenges during the construction phase
  - Stone shifting for dry cladding work on an exterior wall at a higher elevation
  - Monitoring and controlling 5000 workers working in two shifts.
  - Providing a safe and healthy working environment to all 5000+ workers
  - Appropriate safety precautions for workers and staff during Covid-19
  - Controlling and maintaining the environment at the site by adhering to all NGT and DPCB guidelines in Delhi during the winter season when pollution is at its worst (AQI is approximately 300+ throughout the day).

Employee Engagement:

Regular housekeeping drives, monthly EHS drives on high-risk & focus areas and, and safety Month and day celebrations foster a culture of safety and responsibility among all employees. Initiatives like the "Touch the Heart" sessions improve worker morale and productivity.

Digital Innovations:

We leverage digital tools for managing EHS, including QR-enabled asset tracking, mobile app-based safety inspections, and predictive analytics on safety risk profiling to enhance safety performance.

Key initiatives at the organization and project level are,

- New workmen deployed with orange helmets and provided L1, L2, and L3 stickers to identify based on their past work experience to monitor them effectively to safeguard them from high risks in the construction hazard.
- Reinforcing safe behaviour
  - We have launched a new campaign titled 'Reinforcing Safe Behaviour' targeting our workmen and aimed at improving compliance with safe behaviour.

- This campaign focuses on 'Five Mandatory Safe Behaviours' that workmen shall check before starting any critical activity at the project. The critical activities & hazards have been identified from the analysis arising out of our safety risk profiling.
- These mandatory behaviours for high-risk activities are communicated through video a video series in multiple languages and posters.

- Mechanized material handling - Introduced vacuum lifters for stone handling first of its kind.

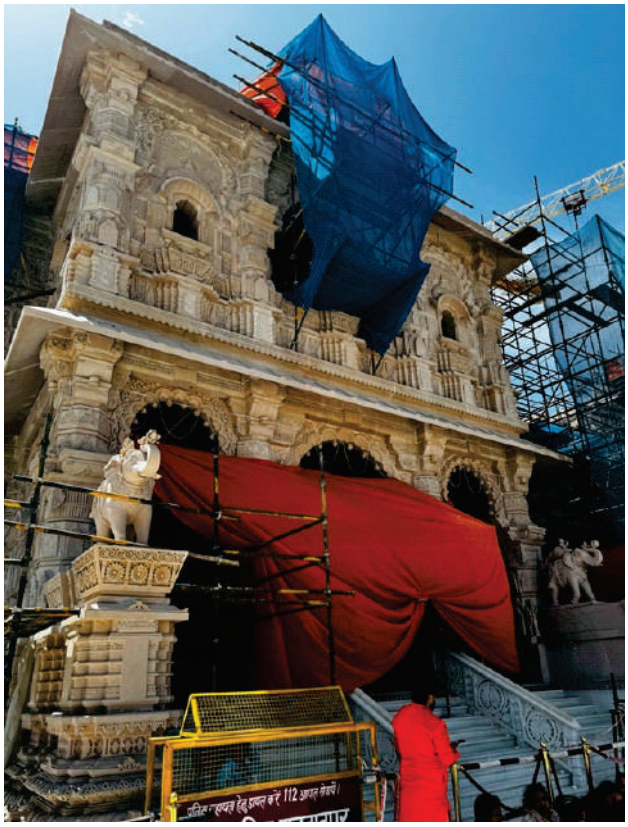
Mitigative measures for other challenges in the current scenario

Material movement from the city:

- Nearly 150-160 truck trailer of Stone, Bulk material & other construction material was entered Ayodhya City which create an logistic issues inside city & outside project premises road. To control safe traffic movement, pre-intimation in one day advance to police control room of vehicle details with driver & helper information and parked outside Ayodhya. It enters city only after announcement by police control room one by one. We tried to maintain safe traffic by deploying dedicated team with traffic marshal. After entering site, we tried to unload vehicle by using mechanical aid to control logistic movement.

Crowd management with the live construction

- After Pranpratishthapna , daily 1 lacs pilgrim visited & offered prayer to Shri Ram lalla which create an safety issues & obstructing balance construction work. But we faced this challenge as an opportunity for developing on of the most effective traffic management plan.We also segregate pilgrim movement & construction activity by providing hard barrication with route / informatory signages with security. We also provide safety catch net with overhead protection all around the temple & Parkota work.
- We also limitize operation of tower crane with 3 cluster zone by providing Anti-collision device. Operation of zone is operational in day & night.
- Daily 2000-3000 VIP pilgrim including Religious leader, politician, Celebrities visited main temple with family & vehicle. We arrange separate path & parking facility which could not obstruct construction activity.



8 Conclusion:

The Shree Ram Mandir Project in Ayodhya is not just a construction marvel but a shining example of what can be achieved with a steadfast commitment to safety, innovation, and excellence. The recognition by the National Safety Council with the Sarvashreshtha Suraksha Puraskar – 2023 Award is a testament to our relentless pursuit of creating a safe and sustainable future.

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