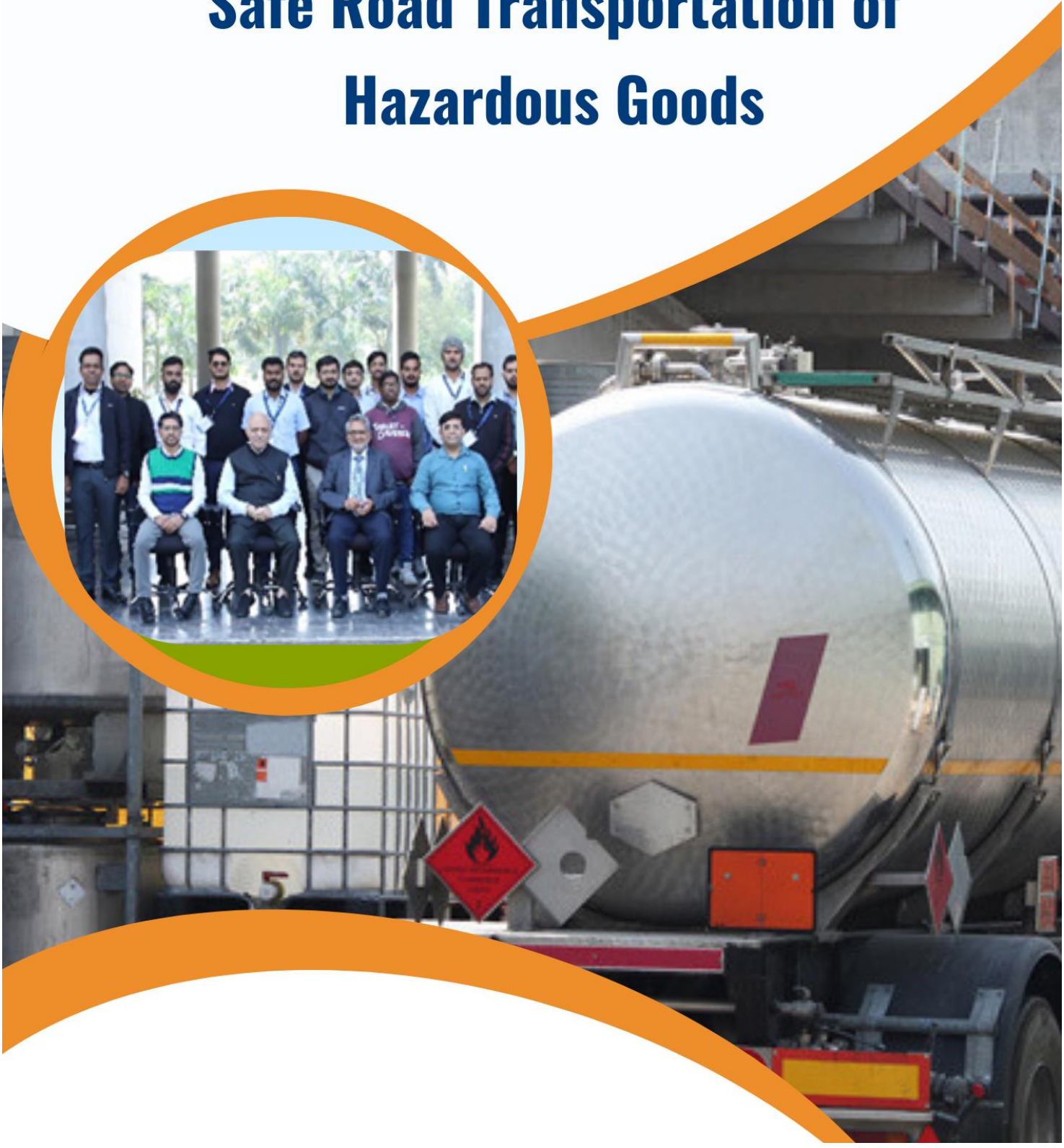
पी एन जी आर बी
PNGRB

GUJARAT INSTITUTE OF DISASTER MANAGEMENT
BUILDING RESILIENCE

Building Competency in

Safe Road Transportation of Hazardous Goods



Background

A three-day Capacity Building Program on Safe Road Transportation of Hazardous Goods was jointly conducted by the Petroleum and Natural Gas Regulatory Board (PNGRB) and the Gujarat Institute of Disaster Management (GIDM) during 29–31 January 2026 at the GIDM Campus, Gandhinagar. The program was organized as part of the ongoing Memorandum of Understanding between PNGRB and GIDM, with the objective of strengthening safety awareness, operational preparedness, and institutional resilience across the oil and gas sector.

The program was aligned with national efforts to enhance regulatory and operational capacities related to the safe movement of hazardous goods by road. In view of the expanding oil and gas infrastructure and increasing transport demands, focused attention was given to key operational areas such as vehicle safety systems, driver safety practices, and journey risk management to minimize transportation-related risks.

A total of 25 participants from various organizations, including public sector undertakings, refineries, oil and gas companies, city gas distribution entities, and safety and environmental departments, attended the program. The training included expert-led technical sessions, practical case discussions, and good practices, enabling participants to strengthen their understanding of journey risk assessment, application of technologies such as Vehicle Tracking System and Geographic Information System, and issues related to tanker truck drivers.

Overall, the program served as an effective platform for experience sharing, practical learning, and alignment with national regulatory requirements as well as internationally accepted safety and disaster management practices for hazardous goods transportation.

The detailed program schedule and the list of participants are provided in **Annexure -1** and **Annexure -2**, respectively.

Welcome Address

The inaugural session formally opened the three-day Capacity Building Program on Safe Transportation of Hazardous Goods at the GIDM Campus, Gandhinagar. The session set the overall context of the program by highlighting the importance of safe operational practices, regulatory compliance, and coordinated institutional efforts in the road transportation of hazardous materials within the oil and gas sector. The role of trained personnel, standard operating procedures, and informed decision-making in reducing operational risks was also emphasized.

The objectives, structure, and expected outcomes of the program were outlined, focusing on knowledge enhancement, practical understanding, and institutional capacity strengthening. Emphasis was placed on interactive learning, case-based discussions, and peer-to-peer exchange of experiences. Participants were encouraged to actively engage in the sessions, raise operational concerns, share field-level insights, and contribute to discussions aimed at improving safety preparedness and response mechanisms.

Shri Gagan Agarwal, Deputy Director(Technical), Petroleum and Natural Gas Regulatory Board (PNGRB), addressed the gathering virtually and highlighted the importance of continued collaboration between PNGRB and GIDM under the existing Memorandum of Understanding. He stressed the need for consistent implementation of safety guidelines, effective monitoring mechanisms, and improved coordination among stakeholders. He concluded by encouraging participants to apply the learnings in their day-to-day operations and disseminate the knowledge gained within their respective organizations to strengthen overall safety culture.

Session 1: Overview of India's Oil and Gas Transportation Risk Profile
By Shri. P. S. Murthy, Former Executive Director, HPCL

Shri Murthy set the context of the session by presenting an overview of the Indian oil and gas sector and its role in the national energy landscape.

He explained the scale of energy consumption in the country and highlighted the gap between domestic production and demand, which has led to a strong dependence on transportation and distribution networks. The session also covered the structure of the marketing and distribution system, including retail outlets, rural fuel access, and the growing pipeline network for crude oil, petroleum products, LPG, and natural gas.

He further explained that despite continuous expansion of pipeline infrastructure, road transportation remains a critical component for last-mile delivery, particularly for LPG and petroleum products. The session highlighted the operational challenges involved in balancing pipeline and road-based transport while maintaining high safety standards. Special attention was drawn to the risks associated with road movement of hazardous goods and the need for strict safety management across the supply chain.

Shri Murthy also discussed safety concerns within the oil and gas sector, noting that although overall fatality numbers are lower when compared to general road accidents, incidents involving oil and gas installations and petroleum transportation carry severe consequences. He referred to accident trends at the national level and pointed out that India accounts for a disproportionate share of global road accident fatalities despite having a relatively smaller share of the world's vehicles.

The analysis presented during the session indicated that road accidents related to petroleum transportation, particularly involving LPG tankers, remain a major area of concern. He explained that reviews conducted across oil and gas

companies consistently identify factors such as unsafe driving practices, road conditions, and vehicle-related issues as key contributors to accidents. Emphasis was placed on human error as a dominant risk factor.

Concluding the session, Shri Murthy highlighted ongoing efforts by the oil and gas industry to strengthen accident reporting systems, closely monitor safety performance, and work in coordination with regulatory authorities and enforcement agencies. He stressed that improving driver behaviour, vehicle fitness, and road safety awareness are essential steps toward reducing accidents and enhancing overall transportation safety.

Session 2: Transport Infrastructure, Vehicle Requirements & Safety Checks
Session 3: Operational Safety & Good Practices

By Shri. Sanjeev Raina, Former Executive Director, BPCL

Shri Sanjeev Raina presented a long-term national perspective focused on building a self-reliant and economically resilient India by 2047. He highlighted that road transport remains the primary mode for movement of petroleum products across the country, making tanker truck safety a critical component of national energy security. He emphasized that safe and reliable transportation can only be achieved through an integrated approach covering road infrastructure, tanker design and certification, regulatory compliance, and uniform safety practices during operations.

He explained that efficient management of petroleum tankers requires a sound understanding of infrastructure needs, vehicle engineering standards, applicable regulations, and field-level safety controls. With technological progress, tanker vehicles have undergone significant improvements, including advanced engine systems, safer fuel transfer mechanisms, and enhanced safety features. Shri Raina stressed the need for regular inspection, preventive maintenance, and

focused training on critical tanker components such as fill and dip pipes, vacuum valves, electrical fittings, and driver cabins, along with strict adherence to quality and safety standards.

He further underlined the importance of accurate tanker calibration and routine operational checks, cautioning that negligence in these areas can result in major accidents, product losses, and broader social consequences.

The session also covered the role of safety technologies such as Vehicle Tracking Systems (VTS), Anti-lock Braking Systems (ABS), and other on-board safety devices in reducing accident risks and strengthening operational control.

While discussing operational challenges, Shri Raina pointed to unsafe practices involving multiple stakeholders within the transportation chain. He noted that these risks can be effectively managed through systematic risk assessment, proper scheduling, real-time monitoring, and disciplined journey planning. Special focus was placed on Journey Management Plans (JMP), which bring structure, accountability, and control to tanker operations. He concluded by stating that when JMP is supported by fatigue management, route risk assessment, technology-driven monitoring, and strong leadership commitment, it significantly improves road safety while safeguarding lives, assets, and the environment.

Session 4: PNGRB Road Safety Guidelines: Purpose and Key Provisions, human factor and Other Causes in Road Accidents (CNG Transportation) and Key initiatives

By Shri. Manish Dhroov, VP, Gujarat Gas

Shri Manish Dhroov provided an overview of prevailing road accident trends and outlined the major categories of incidents commonly observed in road transportation operations. He explained that such accidents typically result from a combination of operational shortcomings, environmental conditions, and human factors. Addressing these risks, he highlighted that the PNGRB road transportation safety guidelines advocate structured safety practices, including regular safety inspections, systematic journey planning, adherence to prescribed duty hours, limitations on night driving, and other preventive measures aimed at minimizing accident occurrence.

He further discussed accident patterns involving both light and heavy commercial vehicles, drawing attention to external influences such as road quality, traffic congestion, and adverse weather conditions. The session examined immediate causes like driver fatigue, distraction, and poor journey planning, along with contributing human-related factors such as vehicle condition, ergonomic stress, and operational pressures experienced by drivers.

The session detailed key elements essential for effective road safety management, such as trip planning, fleet and contract management, driver competency development, emergency readiness, coordination among stakeholders, and structured journey risk assessment. Particular emphasis was placed on targeted training for drivers transporting hazardous goods, including the adoption of defensive driving techniques.

Shri Dhroov also highlighted safety requirements across different stages of operation. Before fleet deployment, focus should be placed on vehicle safety aspects such as speed limiting devices, vehicle stability, and suspension systems. After deployment, safety performance and compliance can be evaluated through structured review tools, regular coordination meetings with transporters, and periodic route risk assessments to identify accident-prone locations.

During the discussion, participants raised concerns related to driver behaviour, literacy levels, health issues, and socio-economic challenges. In his concluding remarks, Shri Dhroov emphasized the importance of adopting a compassionate

and supportive approach towards drivers, improving their working conditions, and enhancing their social recognition as a foundation for achieving long-term improvements in road safety.


Session 5: Classification & Properties of Hazardous Goods
By Shri. Praharsh Nandi, Subject Matter Expert

Shri Praharsh Nandi emphasized that a clear understanding of the classification and characteristics of hazardous goods is critical for the safe transportation of dangerous materials and for avoiding regulatory violations and penalties. He explained that in India, hazardous chemicals are classified under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, primarily based on physical properties such as flammability, toxicity, and reactivity. This national framework is aligned with the United Nations classification system, which groups hazardous materials into nine categories: explosives, gases, flammable liquids, flammable solids, oxidizing substances, toxic and infectious substances, radioactive materials, corrosive substances, and other miscellaneous dangerous goods. He further clarified that while health and environmental hazards are used to identify substances such as toxic and carcinogenic chemicals, physical hazard classification focuses on materials that are flammable, highly reactive, or capable of causing severe harm.

Shri Nandi highlighted the practical value of Transport Emergency Cards (TREM) and recommended their effective and regular use by drivers and emergency

responders for quick decision-making during incidents. Participants shared their concerns regarding the availability of updated TREM cards, standardized Hazchem panels, and uniform labeling practices across the sector. He also explained that tools such as NFPA labels and Material Safety Data Sheets (MSDS) play a vital role in the rapid identification of fire and chemical hazards linked to specific substances.

In his concluding remarks, he stressed that strong safety culture is fundamental to hazardous goods management. This includes proper and clear labeling of all containers, use of suitable personal protective equipment, storage of chemicals only in designated and approved locations, immediate reporting of leaks or spills, and safe disposal of chemicals and empty containers in accordance with prescribed guidelines.

Session 6: Understanding Disaster Risk Management & Current Trends *By Shri. Nisarg Dave, Director (DM), GIDM*

Shri Nisarg Dave explained that Disaster Risk Management (DRM) has become increasingly essential due to the growing occurrence of extreme weather events, largely driven by climate change and unplanned, haphazard anthropogenic activities. He elaborated that disaster risk is a function of hazard, vulnerability, exposure, and coping capacity, and emphasized that disaster resilience can be achieved only by keeping risks under control through a balanced approach involving prevention, mitigation, preparedness, response, and recovery.

He strongly advocated recognizing the role of human-induced factors in disasters and urged participants to move away from the commonly used but misleading term "natural disasters." He explained that while natural hazards may act as triggers, the scale and severity of impacts are often determined by human decisions, planning gaps, and weak safety systems.

The concept of NaTech (Natural Hazards Triggering Technological Accidents) was explained in detail using real-life case studies such as the, the Bhadbhut incident (2013), the Sundarban Oil Spill (2014), etc.

These examples illustrated how natural hazards can escalate into major technological accidents, often exceeding conventional oil and gas accident scenarios in both impact and complexity. He further highlighted that climate change is intensifying the frequency and severity of natural hazards, increasing the risk of cascading events and placing significant stress on emergency response systems and first responders.

Session 7: Audit, Inspection and Compliance Monitoring
Session 8: Case Study Discussion on Jaipur Incident
By Shri. Rajesh Nigam, Former Executive Director, IOCL

Shri Rajesh Nigam spoke about the LPG tanker blast that occurred on the Jaipur–Ajmer Highway in 2024. Drawing lessons from this incident, PNGRB introduced stricter norms for the safe movement of petroleum products by road, with a strong focus on mandatory driver rest, proper vehicle upkeep, and the use of alternatives such as railways for long-distance transport. He outlined the legal framework governing different transport modes, namely road transport

under the Carriage by Road Act, 2007 and Central Motor Vehicles Rules, 1989; maritime transport under the IMDG Code; rail transport under the Red Tariff Rules; air transport under ICAO Technical Instructions and the Aircraft (Carriage of Dangerous Goods) Rules, 2003; and inland waterways under the ADN regulations. He also explained procedures related to TT induction, TT crew induction, and tanker entry processes He stated that drivers involved in petroleum transport should be covered under socio-economic safety nets such as life insurance schemes, including PMJJBY and PMSBY. He further recommended additional welfare measures like regular medical examinations, prompt disbursement of insurance claims, and timely payment of higher wages to drivers, helpers, and extra crew members.

Shri Nigam pointed out key issues in the transportation sector and stressed the urgent need for periodic audits and inspections. Distribution safety, he explained, is ensured through contractor safety management, vehicle safety management, driver safety management, and journey safety management.

He emphasized that risk mitigation measures should be integrated from the design and fabrication stage itself. Inspection activities cover the tank's external and internal condition, thickness checks, manhole assemblies, flame arresters, dip pipes, drain and foot valves, emergency shut-off valves, PV vents, chassis

condition, hose condition, fire extinguishers, markings, and prescribed testing intervals. Similar inspection checks are specifically carried out for LPG tankers as well.

During the interaction, he shared technical insights from his organisation related to quality control programmes for tank trucks. After briefly discussing driver safety and journey safety practices, he elaborated on vendor capability assessment surveys. The speaker and participants exchanged views on effective approaches for engaging vendors and contractors to achieve comprehensive road safety. He concluded the session by expressing his appreciation to the organisers and participants.

Session 9: Legal Liabilities and Insurance
By Shri. Aditya Gurudanti,Associate Director,Stirrup Comm.

This session was delivered by **Shri Aditya Gurudanti** and focused on legal liability, insurance requirements, and compliance procedures related to the safe road transportation of hazardous and dangerous goods.

Shri Gurudanti explained that in the event of accidents, leakages, fires, or spills, legal liability may rest with the consignor, transporter, vehicle owner, contractor, or driver, depending on the nature of default or negligence. Liability arises under relevant provisions of the Carriage by Road Act, 2007, Motor Vehicles Act, 1988, Environment (Protection) Act, 1986, and other applicable safety and pollution control laws. Non-compliance with prescribed safety norms, vehicle fitness, driver working hours, route planning, and emergency procedures can lead to penalties, prosecution, and compensation claims for loss of life, property damage, and environmental damage.

The session highlighted the importance of mandatory insurance coverage for vehicles carrying hazardous and dangerous goods. This includes motor vehicle insurance with hazardous goods endorsement, public liability insurance, and third-party liability coverage. Shri Gurudanti emphasized that adequate insurance safeguards transporters and affected communities by ensuring financial compensation in case of accidents. He also stressed the need for personal accident and life insurance coverage for drivers and crew members to enhance their socio-economic protection.

Shri Gurudanti outlined the essential legal procedures and documentation required for regulatory compliance. These include valid vehicle registration and fitness certificates, permits for hazardous goods transportation, insurance policies, driver licences with hazardous goods endorsement, training certificates, Transport Emergency (TREM) cards, MSDS, and approved route plans.

He emphasized regular audits, inspections, and proper record maintenance as critical elements of compliance. The session concluded by reinforcing that adherence to legal and insurance requirements is fundamental to reducing risk and ensuring safe, compliant transportation of hazardous and dangerous goods.

Session 10: Introduction to the Regulatory Framework Governing Road Transport

By Dr. Rajesh Gujar, Associate Professor, PDEU, Gandhinagar

Dr. Rajesh Gujar delivered a session highlighting the challenges faced by truck drivers on highways, ongoing improvements in highway infrastructure, and key policy recommendations supported by practical examples. He pointed out that the shortage of skilled drivers is largely linked to low wages, limited welfare benefits, harassment, and weak social security systems. He further noted that poor working conditions, fatigue, disrupted family life, lack of supporting infrastructure, inadequate facilities such as restrooms and safe parking, and social stigma discourage individuals from entering or continuing in the profession.

While discussing highway infrastructure development, he explained the integrated approach being adopted to improve road safety through better planning, safer mobility systems, and user-centric road design. He highlighted

initiatives aimed at strengthening road safety through technology-enabled tools, improved emergency response mechanisms, and enhanced roadside amenities for drivers.

Dr. Gujar elaborated on the regulatory framework governing road transportation in India, stating that the Motor Vehicles Act, 1988 and the Central Motor Vehicles Rules form the core legal structure administered by the Ministry of Road Transport and Highways (MoRTH). He highlighted recent amendments and policy updates during 2024–25 that focus on improving vehicle safety and compliance, including revised safety standards for heavy vehicles, mandatory use of advanced braking systems, vehicle stability requirements, and enhanced provisions for vehicle tracking and emergency response systems. He also referred to ongoing regulatory reforms aimed at strengthening driver licensing norms, vehicle fitness certification, enforcement mechanisms, and alignment with global best practices.

He recommended strengthening driver training and awareness, particularly related to road signage, use of local languages, vehicle fitness, and safe driving practices. Organisations were advised to monitor driver behaviour, identify high-risk stretches on long routes, and issue timely alerts for hazardous corridors. He concluded by stressing that a system-based, preventive, and regulatory-driven approach to road safety is far more effective than conventional, reactive measures.

Session 11: Training & Capacity Building Techniques

By Shri. Rajesh Nigam, Former Executive Director, IOCL

Shri Rajesh Nigam delivered a detailed session on training and capacity-building techniques for the safe road transportation of hazardous and dangerous goods, with a specific focus on mid-level managers responsible for operational planning, compliance, and safety oversight. The session began by highlighting recent national and international tanker accident case studies to underline the severity of risks associated with petroleum and hazardous goods transportation. He emphasized the growing safety challenges posed by complex traffic conditions, high accident rates involving commercial fleets, and the significant human, economic, and environmental costs of road accidents.

The session stressed the importance of structured training as a primary risk-reduction tool, particularly for personnel involved in planning, supervision, and

execution of hazardous goods transport. Shri Nigam explained statutory provisions governing transportation across different modes, including road, rail, sea, air, and inland waterways, and highlighted the relevance of BIS IS 18149:2023 guidelines for dangerous goods transportation. He outlined the roles and responsibilities of key stakeholders such as consignors, transporters, contractors, drivers, and regulatory authorities, emphasizing shared accountability for safety and compliance.

A significant part of the session focused on best practices in vehicle safety management, driver and crew competency, and journey management planning. He elaborated on tanker truck induction procedures, crew induction processes, gate entry checks, vehicle fitness requirements, and mandatory safety fittings. The importance of periodic health checks, defensive driving training, simulator-based learning, and continuous driver engagement was highlighted as essential components of an effective safety culture.

Shri Nigam also discussed the paradigm shift from a punishment-oriented approach to a prevention-focused safety model, supported by technology such as GPS tracking, vehicle monitoring systems, AI-based driver assistance tools, and real-time alerts. He shared practical insights on the use of data analytics, safety audits, and vendor capability assessments to identify risks, improve performance, and reduce accident frequency.

The session further emphasized emergency preparedness, including availability of emergency response information, reporting procedures for accidents involving dangerous goods, and coordination with local authorities such as police, fire services, and medical agencies. He concluded by reinforcing that continuous training, robust documentation, technology integration, and proactive safety management are critical for building resilient and compliant hazardous goods transportation systems.

Session 12: Technology and Innovation in Hazardous Goods Transport
Session 13: Emergency Response & Incident Management

By Shri. Om Sanjay Mishra, Chief Executive Officer, LSC

In his session, **Shri. Om Sanjay Mishra** explained how the AI support continuously across the fleet to identify and flag high-risk patterns. The system monitors driver behaviour in real time under critical categories such as risky driving, suspected pilferage, suspected hijack, accident-prone tendencies, and suspected narcotics influence. He also illustrated these concepts through several impactful videos and case studies, showing how vehicles sometimes topple due to driver negligence or unforeseen external factors.

He detailed how risk categorization through AI works by filtering and evaluating each violation based on predefined parameters and behaviour signatures.
The AI classifies events into high-, moderate-, and low-risk categories depending on severity, frequency, and contextual conditions. High-risk events demand immediate intervention, moderate risks need timely corrective action, while low-risk deviations still require consistent monitoring to prevent escalation.
Shri. Mishra further discussed latest technology and the intelligence developed model. It uses a sophisticated permutation–combination framework to compare new violations against past patterns of the same vehicle, contextual indicators, industry-specific thresholds, and long-term behavioural trends. This ensures every alert is accurate, contextual, and actionable, helping organizations strengthen fleet safety and prevent critical incidents.

It was further emphasized that India’s road network spans approximately 6.3 million kilometres, which makes it difficult to handle the road emergencies due to uncontrolled and open environment, limited resources at site, unavailability of experts at site and many more. Such conditions make it too difficult to handle as compared to plant emergencies therefore it is necessary to have quick response teams equipped with necessary equipment and kits.

Closing of the Program

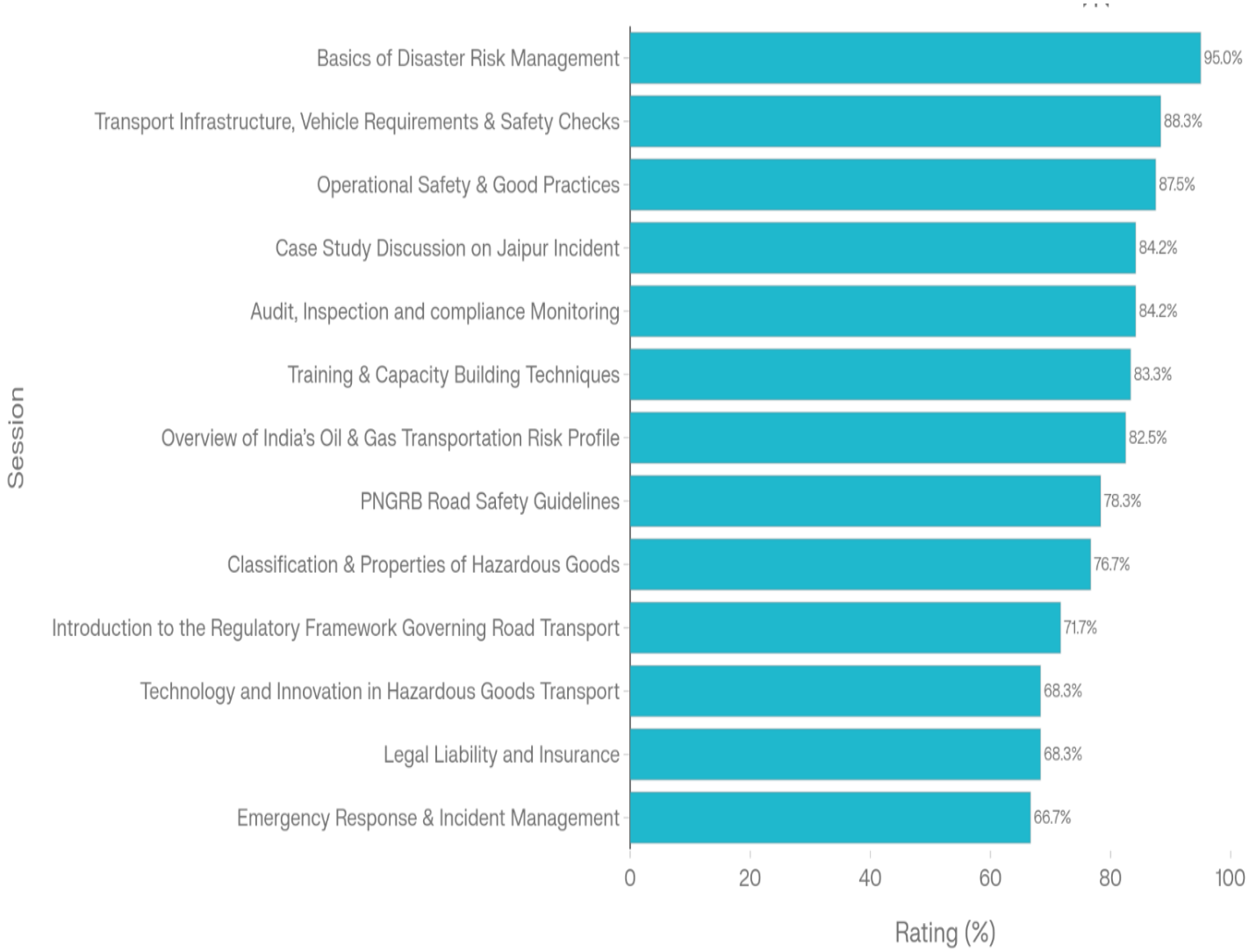
Director (DM) GIDM formally concluded the training program on 'Safe Road Transportation of Hazardous Goods'. All participants were given a post-test followed by feedback. Representatives from GIDM expressed appreciation to the expert speakers and participants for their active involvement and enthusiasm throughout the program. The organisers were thanked for their efforts, arrangements and conducting a training programme on such an important subject.

Feedback of the Program

Participant feedback was obtained through a web-based evaluation system, making it easy for attendees to record their observations and ratings electronically. The assessment covered multiple aspects, including the technical value of the sessions, ease of understanding, applicability of the program, speaker effectiveness, participant involvement, and the suitability of training techniques used. This digital process ensured systematic, efficient, and reliable collection of responses, providing a clear basis for reviewing the programme's effectiveness and areas for improvement.

Speaker Evaluation

Participants provided session-wise feedback by rating how effectively each presentation supported their understanding of hazardous goods transportation. The assessment focused on usefulness to field operations, ease of comprehension, technical adequacy, and overall learning value. The compiled responses offer a clear picture of participant perception across sessions. The consolidated percentage scores for each session, indicating relative performance and scope for improvement, are depicted in the accompanying chart.



Recommendations & Conclusion

The programme generated an encouraging response from attendees as well as subject specialists. Participants expressed interest in expanding the scope of future trainings to cover CNG and LNG operations, keeping in view the needs of CGD entities. They also proposed more experiential components such as field exposure and facilitated group interactions to enhance practical understanding. The arrangements at GIDM, including training facilities, coordination support, and the quality of expert inputs, were widely appreciated. In view of its relevance and impact, participants strongly felt that this training on safe road transportation of hazardous goods should continue on a regular basis with a broader outreach and enhanced capacity-building focus.

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Annexure 1: Program Note

1. Background

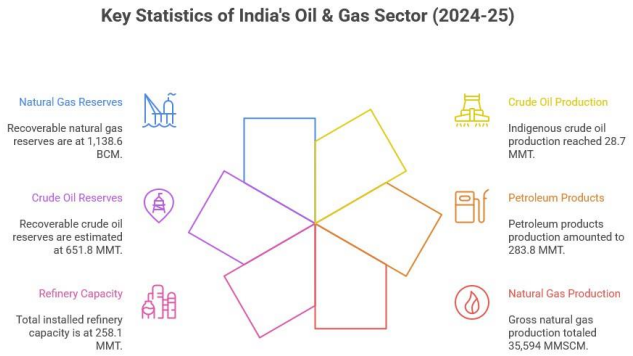
India's oil and gas sector is witnessing exponential growth, backed by a robust investment environment, strong policy push for energy access and sustainability, and the country's rapidly rising energy demand. As the world's third-largest oil consumer, India is projected to lead global oil demand growth between 2023 and 2030 and contribute nearly 25% of the global energy demand increase between 2020 and 2040.

India's downstream oil and gas sector relies heavily on road transportation for the distribution of petroleum products, LPG, and natural gas. Despite the presence of a growing pipeline and rail network, a substantial volume of fuel movement— especially at the regional and last-mile level—is still carried out through road tankers. This logistical dependence on road transportation makes it imperative to ensure that safety protocols and best practices are deeply embedded at every level of supervision and implementation.[1]

The hazardous nature of petroleum products, coupled with India's vast and dense transportation network, poses a significant risk to public health, safety, and the environment. Recognising this, the Petroleum and Natural Gas Regulatory Board (PNGRB) has issued comprehensive Guidelines for Safe Road Transportation of Hazardous Petroleum Products, which form the basis of this training module.

2. Sectoral Overview and Risk Landscape

India's oil and gas sector is a critical pillar of the national economy, contributing significantly to industrial output, employment, and energy security. With rising energy demand and India's expanding role in global energy markets, the sector is rapidly growing. However, with this scale and momentum comes a growing landscape of operational risks.



[1] https://www.investindia.gov.in/sector/oil-and-gas

According to the Petroleum Planning & Analysis Cell, India's total installed refining capacity currently stands at 258.1 million metric tonnes per annum, placing the country among the top four refining nations globally. In the financial year 2024– 25, indigenous crude oil production reached 28.7 million metric tonnes, while petroleum products production touched 283.8 million metric tonnes. The gross production of natural gas stood at 35,594 million standard cubic meters, reflecting the sector's extensive operational footprint.

Such volumes translate into an extensive and complex distribution network involving **23 refineries, being the 4th largest refining capacity globally,** over 93,000 petroleum retail outlets, 10,445 kilometers of crude oil pipelines, 24,130 kilometers of petroleum product pipelines, and more than 25,000 kilometers of operational natural gas pipelines across the country.[2]

Despite the availability of pipelines and railways for bulk transport, a **significant portion of regional and last-mile distribution** continues to depend on **road transportation**, especially for petroleum products, LPG, and natural gas. This dependence renders the road network the **most vulnerable segment** of the logistics chain.

While this robust infrastructure highlights the sector's strength and outreach, it also underscores the **magnitude of risk**. Road transportation in particular is prone to operational hazards like traffic congestion, driver fatigue, mechanical failure, poor route planning, and non-compliance with safety protocols—all of which may lead to accidents, environmental pollution, and public endangerment.

The Risk Dimension

The increasing reliance on road tankers to transport hazardous petroleum products introduces a range of **critical safety risks**, including:

- **Driver fatigue and overwork,** particularly on long or overnight hauls.
- **Traffic congestion and poor road infrastructure,** especially in high- density corridors.
- **Inadequate vehicle fitness,** including lack of anti-lock braking systems (ABS), speed governors, or VTS (Vehicle Tracking Systems).
- **Route planning deficiencies,** such as failure to avoid black spots or hazard-prone zones.
- **Operational violations**, such as over-speeding, unauthorized halts,

[2] https://www.investindia.gov.in/sector/oil-and-gas

or non-compliance with safety norms.
- **Environmental hazards** from spills or explosions following an accident.

The consequences of even minor lapses in these areas can be severe - ranging from vehicle rollovers and fire incidents to large-scale environmental contamination, casualties, and damage to public infrastructure.

3. Rationale for the Training Program

Given the hazardous nature of petroleum transport and the risks involved, and despite robust infrastructure and regulatory guidelines issued by PNGRB, gaps in on-ground supervision, driver training, and journey management continue to pose operational challenges.

In this evolving landscape, there is a critical need to build capacities that can ensure **safe, secure, and regulation-compliant transportation of hazardous petroleum products**. Middle management personnel, including safety trainers and logistics heads, play a pivotal role enforcing safety protocols, monitoring transport operations, and ensuring compliance with statutory norms and must be equipped with:

- A sound understanding of PNGRB safety guidelines
- The ability to implement Journey Management Plans (JMP)
- Skills to monitor driver behaviour, fatigue, and vehicle compliance
- Competency in emergency preparedness and incident management

This training program is designed to address this gap by enhancing the capacity of supervisors and trainers to implement good practices in journey planning, driver oversight, risk mitigation, and emergency response. It aims to build a strong foundation for proactive safety culture across the oil and gas transportation chain.

4. Learning Objectives

This training module aims to:

- Familiarize participants with PNGRB’s guidelines for safe transportation of hazardous petroleum products.
- Build competency in Journey Management Planning (JMP), risk mapping, and hazard anticipation.
- Strengthen managerial and communication skills to support frontline drivers.
- Promote a safety-first culture by integrating behavioral safety

- and compliance monitoring.
- Improve preparedness for emergency scenarios and incident response.

5. Target Participant

- Mid-level managers involved in transportation operations within Oil Marketing Companies (OMCs)
- Logistics Managers from gas distribution companies and transport contractors
- Safety Trainers and Officers
- Emergency Response and Incident Managers
- Tanker Operation Heads and Compliance Auditors

6. ProgramOutline

Date: 26 – 28 November, 2025
Program Mode & Duration: 3 Days Residential Program
Location: GIDM Campus, Raysan, Gandhinagar, Gujarat-382426
Delivery Format: Classroom lectures, case studies, group discussions, simulation-based exercises and practical demonstration/Visits.

7. Training Coverage

This capacity-building program is designed to enhance competencies in managing the safe road transportation of hazardous and dangerous goods (HDG), with a specific focus on petroleum products, LPG, and natural gas. The training will cover:

- Overview of India's oil & gas transport ecosystem and associated risk landscape
- PNGRB guidelines and statutory regulations governing HD Groad transportation
- Journey Management Planning and route risk assessment
- Vehicle safety systems, inspections, and crew fitness
- Emergency response, TREM card usage, and incident handling
- Coordination with transporters, emergency services, and local authorities
- Public safety measures along HDG routes
- Training techniques for behavior change and field-level awareness
- Audits, Inspections & Compliance monitoring

8. Faculty

The faculty would be from PNGRB, GIDM, Senior Safety and Transport Officers from Oil PSUs, experts from Industry and academia.

9. Outcome and Certification

Participants who complete the module will be awarded a **Certificate of Completion** endorsed jointly by **GIDM and PNGRB**, validating their competencies in the safe transportation of hazardous petroleum products.

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Program Agenda **Safe Road Transportation of Hazardous Goods** Date: 29-31 January 2026		
Time	**Session**	**Speaker**
Day 1 (29.01.2026)		
10:00 – 10:15	**Registration** **Welcome & Inauguration** • Welcome, Objectives, Expected Outcomes • Pre-Test of Participants	**GIDM**
10:15 – 10:30	**Inaugural Address by PNGRB**	**Shri. Gagan Agarwal**, Dy. Director (Tech.), PNGRB
10:30 – 11:30	**Overview of India's Oil & Gas Transportation Risk Profile:** • Sector profile, transportation mix • Distribution channels & infrastructure mapping • Accident data trends and high-risk zones	**Shri P.S. Murthi** Former Executive Director, HPCL
11:30 – 11:45	***Tea/Coffee***	
11:45 – 13:00	**Transport Infrastructure, Vehicle Requirements & Safety Checks** • Design and construction of road tankers, bullet tanks and cylinders • PESO-approved vehicle design for petroleum and gas • Maintenance, calibration and periodic testing requirements • Vehicle fitness and safety checks: Inspection criteria, role of testing centers & certifying agencies, and digital tools for recordkeeping of inspections • Vehicle tracking and monitoring systems (AIS 140, GPS) Tank lorry fittings: safety valves, bonding, earthling, grounding •	**Shri Sanjeev Raina,** Former Executive Director, BPCL
13:00 – 14:00	***Lunch***	

14:00 – 15:15	**Operational Safety & Good Practices:** • Safe loading/unloading procedures • Journey Management Planning (JMP), risk assessment and scheduling Driver fatigue • management and trip discipline Fire prevention, spill control, and hazard	**Shri Sanjeev Raina,** Former Executive Director, BPCL
15:15 – 15:30	***Tea/Coffee & Snacks***	
15.30 – 16.45	**Human Factor and Other Causes in Road Accidents (CNG Transportation) and Key Initiatives** • Clauses of PNGRB Road Safety Guidelines • Key mandates for entities • Implications for supervisors	**Shri Manish Dhoov** VP, HSE Gujarat Gas
16.45 – 18.00	**Classification & Properties of Hazardous Goods:** • Types of petroleum products and gaseous fuels (Petrol, Diesel, LPG, CNG, LNG, ATF) • Classification under UN Dangerous Goods System • Flash points, flammability, toxicity, vapor pressure, density • Material Safety Data Sheets (MSDS)	**Shri Praharsh Nandi** Subject Matter Expert

Day 2 (30.01.2026)		
10:30 – 11:45	**Basics of Disaster Risk Management** • Basic Concepts of Disaster Risk Management • Current Disaster Trends in India • Reasons for Disasters & Key Risk-Reduction Measures	**Shri Nisarg Dave** Director (DM) GIDM
11:45 – 12:00	***Tea/Coffee***	
12:00 – 13:15	**Audit, Inspection and compliance Monitoring** • Checklist for Drivers, vehicle and terminal Audit • Compliance Documentation: Trip Logs, Permits, • SDS etc; PNGRB and PESO inspection procedure.	**Shri Rajesh Nigam** Ex. Executive Director, OICL
13:15 – 14:00	***Lunch***	

14:00 – 15:15	**Case Study Discussion on Jaipur Incident:** • Discussion on Jaipur Incident • Root cause analysis and contributing factors • Corrective actions taken and regulatory responses, • Key lessons learned for improving road safety and emergency preparedness	**Shri Rajesh Nigam** Former Executive Director, IOCL
15:15 – 15:30	***Tea/Coffee & Snacks***	
15.30 – 16.45	**Legal Liability and Insurance:** • Liability in case of accidents or spills • Insurance coverage for hazardous goods • Transport, Legal procedures and documentation for compliance	**Shri Aditya Gurudanti,** Associate Director and Head, Stirrup Communication
16.45 – 18.00	**Introduction to Regulatory framework Governing Road Transport** • Highlight key safety challenges faced by truckers • Existing safety provisions and infrastructure • Present practical improvements and policy recommendations • Showcase successful case studies or good practices from India	**Dr. Rajesh Gujar,** Associate Professor, PDEU.

Day 3 (31.01.2026)		
10:30 – 11:45	**Training & Capacity Building Techniques:** • Principles of adult learning and pedagogy • Training delivery methods: classroom, e-learning, on-the-job • Assessment and feedback techniques • Trainer's role in behavior change and risk perception, Integrating public safety into training, covering awareness campaigns, signage, and evacuation protocols for high-risk area, Engaging communities along HDG routes through localized safety messaging and drills, Role of trainers in fostering a safety-first culture across personnel and public interfaces	**Shri Rajesh Nigam** Former Executive Director, IOCL
11:45 – 12:00	**Tea Break**	
12:00 – 13:30	**Technology and Innovation in Hazardous Goods Transport:** • Use of telematics, IVMS, and geo-fencing • Automatic braking, rollover prevention, , and fatigue alert systems • Digital documentation and e-permits Automation at terminals and depots	**Shri Om Sanjay Mishra,** Chief Executive Officer, LSC
13:30 – 14:00	***Lunch***	
14:00 – 15:30	**Emergency Response & Incident Management:** • On-site and off-site emergency preparedness • ERDMP (Emergency Response and Disaster Management Plan) guidelines by PNGRB • Incident reporting and investigation techniques • First responder actions (drivers, crew, and depot staff) Coordination among transporters, emergency services, police, local authorities, and regulatory agencies, Communication protocols during emergencies and crisis communication with media & public	**Shri Om Sanjay Mishra,** Chief Executive Officer, LSC
15.30 – 16.15	***Closing***	

Annexure 2: Participants List

#	Participant Name	Designation	Department
1	Dhruvkumar Shantibhai Prajapati	Senior Engineer	Gujarat Gas limited
2	K SWETHA	Manager (LPG-Safety)	Indianoil Corporation Limited
3	Survi	Manager(LPG-Safety)	Indian Oil Corporation Limited
4	Sreejith K	Assistant Manager LPG SAFETY	Indian Oil Corporation Ltd, Indane Bottling plant Quilon
5	Umang Mukeshbhai Patel	Senior Engineer	Gujarat Gas Limited
6	Bommana Anirudh	Senior Officer	Gas Authority of India Limited
7	Jude P.Mackson	Manager (LPG-Safety)	IndianOil Corporation Limited, Indane Bottling Plant Trichy
8	DHEERAJ TIWARI	ADDITIONAL GENERAL MANAGER	INDRAPRASTHA GAS LIMITED
9	Shashank Pandey	Assistant Manager	Maharashtra Natural Gas Limited
10	Murari kumar	Management Trainee	Maharashtra Natural Gas Limited
11	Shashank Shekhar	Assistant manager	Maharashtra natural gas limited
12	Harsh Kasana	Additional General Manager	Indraprastha Gas Limited
13	DHANANJAY RAI	ASSISTANT MANAGER(LPG-SAFETY)	INDIAN OIL CORPORATION LIMITED
14	HOLALAPPAGOUDA S CHAYAPPAGOUDRA	Associate Executive	BHARAT PETROLEUM CORPORATION LIMITED
15	Durgesh Dole	Deputy General Manager(Operation & Maintenance)	GAIL INDIA LTD
16	Prahlad Singh Chouhan	Assistant Manager	Adani total gas limited
17	Harshit Tripathi	Group Manager Security	HPCL LNG LTD
18	Chaudhari Bhavesh Ravindrabhai	Executive Engineer	Torrent Gas Limited
19	Tapas Ranjan Tarai	Deputy Manager Technicial	Gujarat Gas Ltd.
20	Gopal Haribhai Rathod	Manager- LNG Operations	HPCL LNG Limited

21	Koushlendra Pal Singh Ranawat	Assistant Manager	Adani Total Gas Limited
22	Naushad Alam	Engg. Office, Operation & Maintenance and HSE officer	Bharat Petroleum Corporation Limited
23	RHYTHM PARMAR	Executive	TORRENT GAS LIMITED
24	Amarendra Kumar Yadav	Assistant Manager	Adani Total Gas Ltd.
25	Pratik Kumar C Pandya	Senior Road Transport Compliance Coordinator	Shell India Markets Private Limited

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