पी एन जी आर बी
PNGRB

GUJARAT INSTITUTE OF DISASTER MANAGEMENT
BUILDING RESILIENCE

Building Competency in

Safe Road Transportation of Hazardous Goods

1. Background

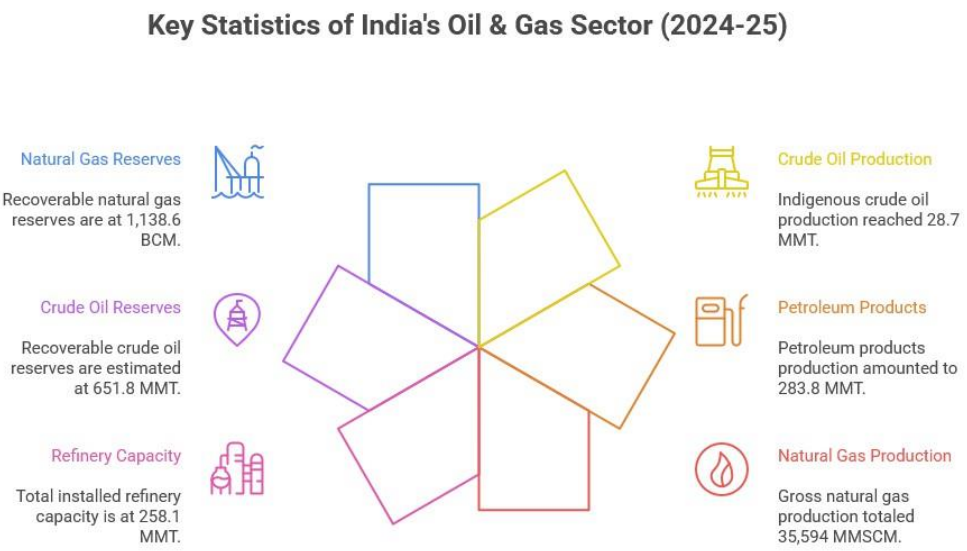
India's oil and gas sector is witnessing exponential growth, backed by a robust investment environment, strong policy push for energy access and sustainability, and the country's rapidly rising energy demand. As the world's third-largest oil consumer, India is projected to lead global oil demand growth between 2023 and 2030 and contribute nearly 25% of the global energy demand increase between 2020 and 2040.[1]

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.

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. Recognizing 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, 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.

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

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 behavioural 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. Program Outline

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 HDG road 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.

10. Training Course Fee

The course fee is INR 20,000/- per participant (inclusive of GST). Participants will be provided accommodation (twin sharing basis), along with breakfast, working lunch, dinner, and refreshments during the program. Details of the ac comm odation facilities at GIDM can be accessed at: https://gidm.gujarat.gov.in/ en/resi dential- annexe.

Please Note: *GIDM will not make arrangements for the supporting staff of nominated participants. The responsibility for nominating participants and facilitating their travel from the base location to the training venue lies with the respective nominating agency. All travel-related expenses of participants shall be borne by the concerned nominating agency.*