Summary

Knowledge Sharing Workshop- "Strengthening Safety in City Gas Distribution Network" organized by PNGRB in collaboration with Assam Gas Company Limited (AGCL) and Tripura Natural Gas Company Limited (TNGCL)

Petroleum And Natural Gas Regulatory Board in collaboration with Assam gas Company Limited and Tripura Natural Gas Company Limited organised a Knowledge Sharing Workshop on **Strengthening Safety in the City Gas Distribution (CGD) Network** on **23rd – 24th January 2024** in Guwahati, Assam.

The Chief Guest of the event Shri A.K. Tiwari, Member, PNGRB delivered the keynote address quoting that "*The Flow of safety culture is broadening through this type of knowledge sharing workshop.*" In his remarks, Shri Tiwari highlighted the critical role of CGD entities as natural gas demand creators & assessors in the country. He highlighted importance of CGD networks through which consumption of gas in CGD sector will increase significantly in the coming decade. So, ensuring safety and integrity of CGD networks is essential to ensure supply security and catering energy demand of the nation.

The workshop consisted of various technical sessions based on the Construction/O&M safety in CGD Networks; Regulatory framework, Incidents prevention & mitigation measures; and Best Practices & Technology Intervene in CGD Sector.

Key aspects of various sessions held during the subject workshop has been provided below:

Sessions held on the 1st day (23.01.2025)

- **Technical Session 1: Statutory Rules/Regulations for CNG stations: PESO perspective**

In this session, basic definitions which includes definition of Cylinder, CBG, CNG and types of CNG Stations were briefed upon. Critical issues being encountered during CNG operation such as improper retro fitment, spurious cylinders/filling of test due cylinders, etc were also deliberated upon. Finally, recommendations on safety requirements in CNG Station which includes checking of validity of cylinders, quality of natural gas, various safety inter-distances, emergency shutdown systems, and Emergency Handling, etc were discussed.

- **Technical Session 2: A Comprehensive Approach to Digital Smart Infrastructure and Operational Excellence for Assam Gas Company Limited (AGCL) as per Industry 4.0**

During this session AMTRON along with AGCL and MECON mainly covered three topics –

1. Private 5G Market outlook for Oil and Gas Sector, its key aspects and its advantages which includes High speed connectivity with mobility, security, and scalability.
2. GIS based gas pipeline management – Its advantages include enhanced maintenance planning, operational efficiency, cost optimization, incident management and risk mitigation.
3. A new model for Integrity Management System (IMS) based on Risk assessment of various facilities of CGD networks including Real time data processing & Monitoring, Advanced analytics & predictive maintenance, improved decision making and **Every hour/Everyday** Integrity.

- **Technical Session 3: Best Practices in PNG O&M, Asset Integrity, and Digitalization. - IGL**

In this session, various best practices adopted by IGL to ensure safety and operational efficiency were highlighted, which are listed below:

1. Implementation of SCADA in Odorization and Sectionalizing valves.
2. Real time Monitoring of Field Regulating Station (FRS) on SCADA portal.
3. Smart PNG meters for automatic reading of meters.
4. Utilisation of new advanced technologies such as Laser gas detectors, pipeline tracker, etc.
5. Implementation of Geographical Information System (GIS).
6. Digital Initiatives such as Field Mobile App for end-to-end support for DPNG customers and E-billing.
7. Development of General Service Platform for data analysis w.r.t PNG connections, Complaints pending, Density plotting of pending complaints, PNG incident geographical view and Automatic gas loss calculations.

- **Technical Session 4: Safety challenges in laying gas pipelines infrastructures "practices & initiatives" - MGL**

Key aspects of HSE management currently in practice at Mahanagar Gas Limited (MGL), which includes HSE compliance, Safety Leadership, Environment/Public awareness, Contractor Safety management and HSE Reward Programmes were highlighted. Then, site challenges such as laying of pipelines amidst cluster of utilities, narrow roads and on-going projects in the city were deliberated.

Further, innovative initiatives taken by MGL such as development of **mini-HDD machine** which requires less space and involves shorter drilling paths compared to conventional HDD machines were briefed upon.

Session concluded by highlighting key challenges related to Work -At- Height in Mumbai High Rise building were highlighted and MGL's addressal on the same by implementation of Rope Access System & Suspended lifts.

- **Technical Session 5: PNGRB's session on Regulatory Framework for CGD networks**

In this session, PNGRB Team highlighted the provision of PNGRB ACT and its Technical and Safety Regulations. Intent and Scope of each Technical Regulation i.e. ERDMP, T4S, IMS & TPCA Regulations. Further, Recent initiatives taken by PNGRB to ensure safety & integrity of the CGD networks were discussed.

- **Technical Session 6: CGD Network –Road Map in NE Infra Development and Gas Network Connectivity**

In this session, connectivity status of North-East Gas Grid with CGD networks along with a strategic roadmap for gas-based development in the North-East Region was highlighted. Further, importance of North-East Gas Grid connectivity to ensure supply & distribution of natural gas in the North-East Region were also emphasized upon.

Further, some policy recommendations such as "Ujjwala" like scheme for PNG and Re-evaluation of Non-performing Gas for optimal resource utilization were also shared.

- **Technical Session 7: Digital Twin for AGCL and Possibility of incorporating old assets in Digital Twin**

The session commenced with a briefing about Digital Twin, its importance and its relevance in Energy Infrastructure. Then, he highlighted about the key functions of Digital Twin technology which includes real time performance monitoring, improving system performance by identifying & resolving issues pro-actively.

Further, the session concluded with a deliberation on the application of Digital Twin technology in Oil & Gas Sector, which includes –

1. Asset Management
2. Predictive Maintenance
3. Optimizing Operations
4. Safety & Risk management.

- **Technical Session 8: PNGRB's session on Pathways for Hydrogen Transmission and future Roadmap: PNGRB perspective**

PNGRB team highlighted key initiatives taken by PNGRB on Hydrogen transmission and distribution through pipelines. Details of PNGRB approved Hydrogen blending pilot projects in CGD networks were briefed upon.

Further, key outcomes of the study conducted by PNGRB in association with the World Bank and ICF on "Pathways for transmission of Hydrogen through Natural gas pipelines and city gas distribution networks were highlighted upon.

- **Technical Session 9: PNGRB's Expert session on Audits & Inspections: Importance and its relevance regarding CGD Safety. – Shri Satish Geda**

In this session, the importance of Safety Audits, its benefits, and its impact on system integrity were highlighted. Furthermore, key observations made in the Audits/Inspection of CGD networks were also deliberated upon.

- **Technical Session 10: PNG Stoves and its advantages – BPCL**

In this session, disadvantages of retro fitment of LPG Stoves for PNG usage, which includes – drop in efficiency, Safety concerns and more GHG emissions were highlighted.

Further, the benefits of using BIS certified PNG stoves, which includes, increased efficiency, Safer to use, less GHG emissions were emphasized upon.

Session held on 2nd day (24th January 2024)

- **Technical Session-1 Initiative taken to prevent road accidents: LCV/ HCV – Gujarat Gas**

The session commenced with emphasis on the causes of Road incidents. Key elements of Road safety which includes Trip management, contract management, Vehicle management, Driver management, Emergency management, Stakeholders management and journey management were briefed upon.

Further, initiatives taken by Gujarat gas for ensuing road safety, such as utilisation of Vehicle tracking system, Restriction on Night driving, Route risk assessment and Hazardous goods transportation training to Drivers etc were highlighted.

- **Technical Session-2 Ensuring Safety in CGD: GAIL India**

This session included deliberation on key topics such as Safety Challenges being encountered in CGD networks such as lesser control in assets, risk of third-party damages, etc and Safety initiatives being implemented by GAIL, such as Mass Awareness weeks, External Safety trainings, Mock Drills and Public Awareness programmes.

- **Technical Session-3 Prevention and Learnings from Incidents of Third-Party Damages / Accidents in CGD Industry – Indian Oil**

The session commenced with briefing upon the Safety aspects of its CGD networks, which includes 24X7 Emergency Control Room and Emergency Response Vehicles, Surveillance by Bike/foot, Leakage surveys, etc. and various case studies & learnings on the incidents caused by Third part damages. Efforts being undertaken by IOCL for reduction of third-party damages such as introduction of CGD Safety week were also highlighted.

- **Technical Session-4 Safety Aspect of CGD Network – Oil India Limited**

In this session the Safety hazards associated with the CGD networks and required safety management for the CGD networks, which includes Robust Firefighting system, ERDMP, Risk Management, Internal Safety Audits, Trainings, etc. were deliberated upon.

- **Technical Session-5 Planning, Design and Construction of CNG Stations and Safety Challenges thereof – IGL**

This session consisted of deliberation on key topics such as process for setting up of CNG Stations including Planning, Land Selection, construction aspects and Safety challenges being encountered such as unskilled manpower, on-board CNG cylinders testing, unavailability of Safety engineers, lesser availability of Cylinder hydro testing, etc.

- **Technical Session-6 Safety Climate and Safety Culture – BPCL**

This session showcased the comparison between Safety Climate and Safety Culture and their role in understanding and improvement of workplace safety. Further, Steps for creating a Positive Safety culture were also deliberated upon in this session.

- **Technical Session-7 Smart Safety Solutions: Leveraging AI and Behavioural Data for Accident Prevention and Optimization in Oil and Gas Worksites – AGCL**

Behaviour Based Safety was briefed upon along with its key elements which includes counselling & collaboration, Data driven approach, training & development etc. Advantages of leveraging AI for proactive Safety culture, which helps in Hazard Detection, proactive risk reporting, etc.

- **Technical Session-8 Operation Excellence- Automation of Business Operations – ATGL**

Digitalization initiatives taken in ATGL to ensure Operational Safety and efficiency were highlighted, which includes MyAdaniGas platform, utilisation of IoT based Sensors, Driver Management system, GIS, Partner Payment Portal (PPP) etc.

- **Technical Session-9 Customization of Integrity Assessment Techniques for CGD Steel Pipelines for the Northeastern Region: Technologies and Best Practices – AGCL**

In this session, challenges encountered during Integrity management of City gas distribution networks were highlighted and Learnings of AGCL regarding the same were shared.

- **Technical Session – 10 International Best Practices in CGD Safety – Osaka Gas**

In this session, History of major incidents, its impact on CGD networks and key learnings were deliberated upon. Also, brief of Safety Management System including Emergency Response were also presented. Highlight on innovative initiatives taken by Japan such as E-methane were also part of the presentation.

- **Technical Session -11 Ensuring Safety in CGD; Preventive and Mitigation Measures – IGL**

In this session, Swiss Cheese Model of Accident Causation was briefed upon including the steps which includes Hazard, Top Event, Threats, Consequences and barriers. Further, various preventive barriers to prevent incidents were also emphasised upon, which includes Compliance to Standards/Regulations, Risk Assessment, Engineering Control & Process/Design Safety and Administrative controls.