

Safety and Regulatory Structure for CNG,CNG-H2 Vehicles and Fuels in India

December 10-11, 2009

**Ambrish Mishra
Director (Marketing Operations)
Oil Industry safety Directorate
Ministry of Petroleum and Natural Gas
Government Of India
email : ambrish.mishra@gov.in**

- 1. Refineries: 17 PSU + 3 Private**
- 2. POL Storage (PSU): More than 400**
- 3. LPG storage and Bottling Plant (PSU): 179**
- 4. Others Gas processing Plants of GAIL and ONGC**

Major Statutory Authorities and Norms

1. Petroleum and Safety Organization (PESO)

- A) Petroleum rules under Petroleum Act (1934) by MOPN&G
- B) Various Rules (Gas Cylinder Rules and SMPV etc) under the Explosives Act under Ministry of Commerce and Industry
- C) To exercise some provision of Environment Act

2. Chief Inspector of Factories of Respective State

- A) Factories Rules under Factories Act of Ministry of Labour
- B) To exercise some provision of Rules under Environment Act

3. Directorate General Mines Safety (DGMS) under Ministry of Labour

4. Petroleum and Natural Gas Regulatory Board (PNGRB)

5. Oil Industry Safety Directorate (OISD)- Only for Offshore

Background of Establishment of OISD

Major Incidents in Oil Industry in 1980s

- **LPG Plant – Explosion & Fire in LPG Bottling Plant- 1984**
- **Explosion & Fire – Kochi Refinery**
- **Explosion & Fire – LPG facility at Koyali Refinery**

Need : Professional Technical body to bridge the gap

- ✓ **In the year 1986 , consequent to Fire and Explosions - OISD was formed on Self Regulatory basis by Government of India For PSUs**

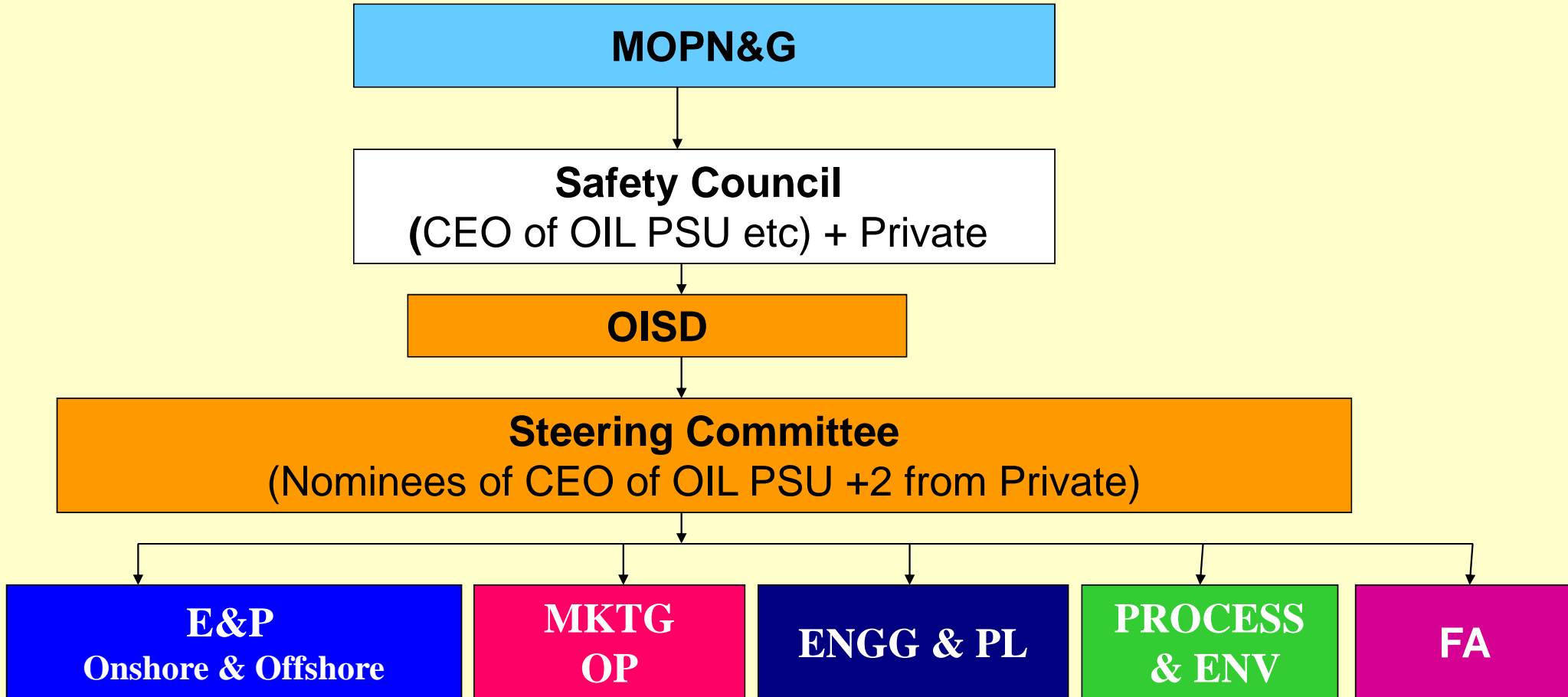
Objective

- **To provide a Professional Technical body for hydrocarbon sector (Oil PSUs) to:**
 - **Elaborate safety standards, procedures**
 - **Check implementation of safety regulations and analysis of incidents**
 - **Interface between regulators and industry**

Scope of OISD

- **Exploration & Production – Inland & Offshore**
- **Refining & Gas Processing**
- **Transmission - Cross Country Pipeline, City Gas distribution system, Road Transportation**
- **Storage & Distribution**
- **Environment**

Organogram



Safety Council Members

Ministry of Petroleum & Natural Gas

- **Secretary, P&NG - Chairman**
- **Additional Secretary, Joint Secretaries, Advisors, Secretary-OIDB, ED-CHT, DG-DGH**

Petroleum Industry

- **Chief Executives of all PSU under MOP&NG (i.e. IOCL, BPCL, HPCL, BRPL, CPCL, EIL, ONGC, OIL, GAIL, NRL), Two from private sector on rotation basis from 2008**

Statutory Bodies

- **Chief Controller of Explosives, DG - FASLI, DGMS, Advisor(Fire)-MHA, Secy-Central Electricity Authority**

ED-OISD- Member Secretary

What OISD Does

- **Development of standards**
- **Institutionalized Safety Audits**
 - **Pre- Commissioning Audit**
 - **External Safety Audit**
 - **Surprise Safety Audit**
- **Incident Investigations, Collation and analysis**
- **Capacity building (i.e. Training)**
- **Safety Performance Evaluation**
- **Tie-up / association with national / international bodies**
- **Dissemination of Information**

Institutionalized Safety Audits

- External Safety Audits
- Pre-commissioning Safety Audits
- Surprise Checks

- **Monitoring of Recommendations**

Regulations on CNG for Vehicles in India

- **The Regulations / Requirement From Environment Authorities (1993-94)**
- **Intervention and Direction of Supreme Court Of India in Public Interest (1998)**
- **Need: Clean Fuel for vehicles (Mandatory from April 2002)**
- **Formation of Environment Pollution (Prevention & Control) Authority for the National Capital Region (EPCA)**

Major Regulatory Authorities for CNG+

- **For Vehicles**
 - **State Road Transport Authority under Motor Vehicle Rules**
- **For Vehicle Type Approval and Certification**
 - **Automotive Research Association Of India under Motor Vehicle Rules**
- **For Dispensing Stations and Pressure Vessels**
 - **Petroleum and Explosives safety Organisation**

Codes and Standards For CNG+

Motor Vehicles Acts /Rules

1. AIS:24: Safety and Procedural Requirement for Type Approval of CNG Operated Vehicles By ARAI
2. AIS 28 : Code of practice for Use of CNG in Internal Combustion Engines by ARAI
3. ISO (BIS) specification for components

Explosives Act

1. Gas Cylinder Rules
2. OISD STD-179 :Safety Requirements on Compression storage, handling and Refueling of Natural Gas for Use in Automotive Sector by OISD

Codes and Standards For H:CNG+

- No Change in Vehicles system up to 20% Mix
- Explosives Act :
 - Need certain Changes in
- OISD STD-179: Safety Requirements on Compression storage, handling and Refueling of Natural Gas for Use in Automotive Sector as regards inter-distances and specific safety requirements

Areas of Concern

- Quality monitoring of Natural Gas
- Temper proof Filling Nozzle
- Proper Fitment and Maintenance of CNG Systems and Vehicles

Areas of Concern for Hydrogen

- Undetected Leak
- Piping and pressure vessel rupture
- Inadequate inert gas purging
- Vent and exhaust system incidents
- Electrical short circuits
- Static electricity
- Failure of SRV
- Leakage through joints
- Reaction with contaminants
- Release of hydrogen

Thank You