

SAFETY PRACTICES IN CGD SECTOR

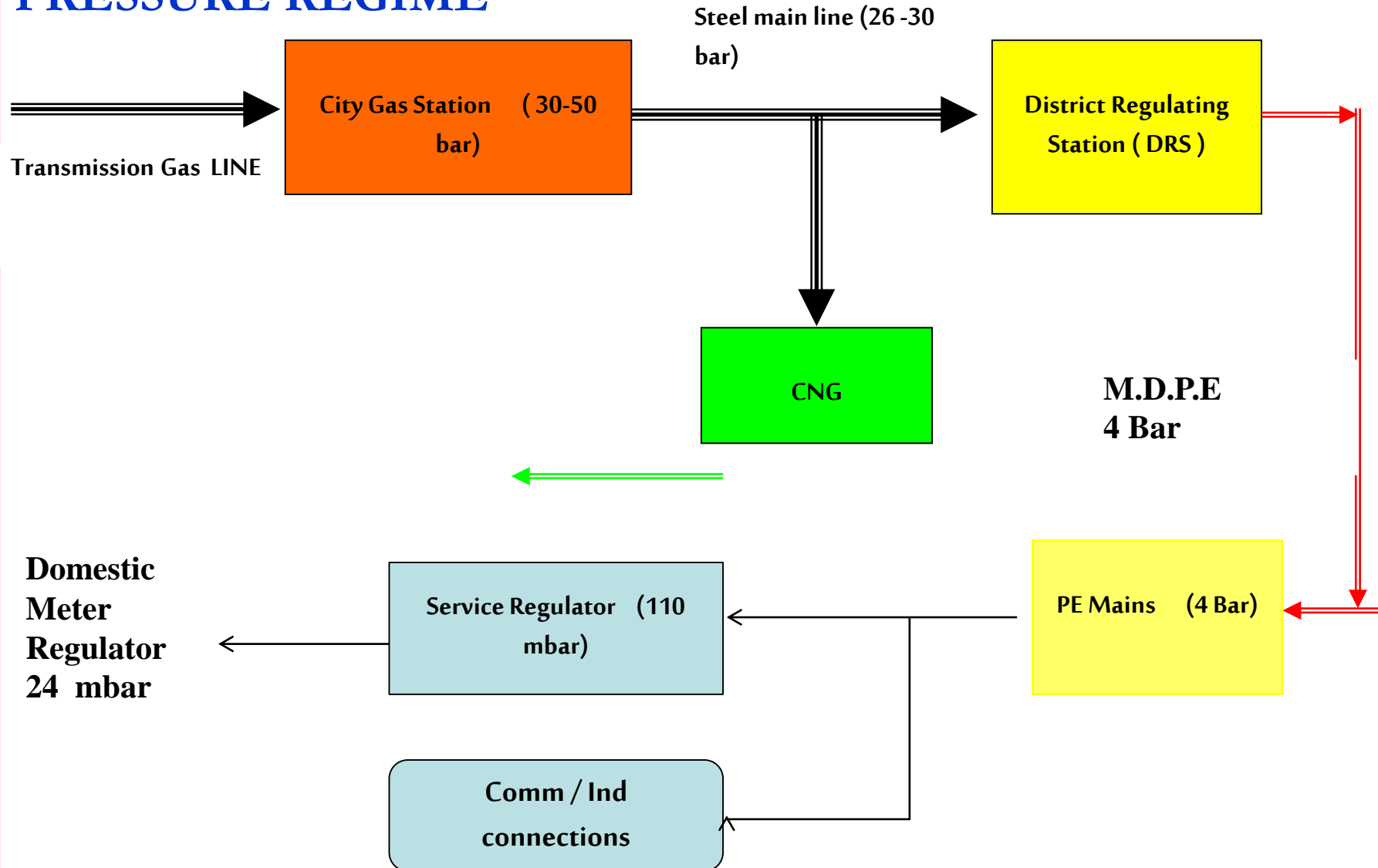


R. B. Singh

Associate Vice President (PNG Projects) - Adani Gas Limited

CGD LINE DIAGRAM

PRESSURE REGIME



INHERENT SAFETY FEATURES IN INSTALLATIONS

1. City Gate Station (CGS) :

- Emergency safety valve (Actuated Operated)
- SRV on knock out & filters
- Two stages of safety (1) Monitor (2) SSV
- Odourization
- Fixed gas detector system

2. Steel Network :

- Corrosion resistance (ICCP)

3. DRS (District Regulating Station)

- Actuator Operated Valve
- Monitoring of differential pressure across filter through SCADA.

4. PE mains :

- Regular Patrolling and Lock Pressure test
- Valve Chamber Maintenance
- Earthing (Prevent from static charge) at the time of squeezing , cutting & saddle installation

INHERENT SAFETY FEATURES IN INSTALLATIONS

4. SCADA:

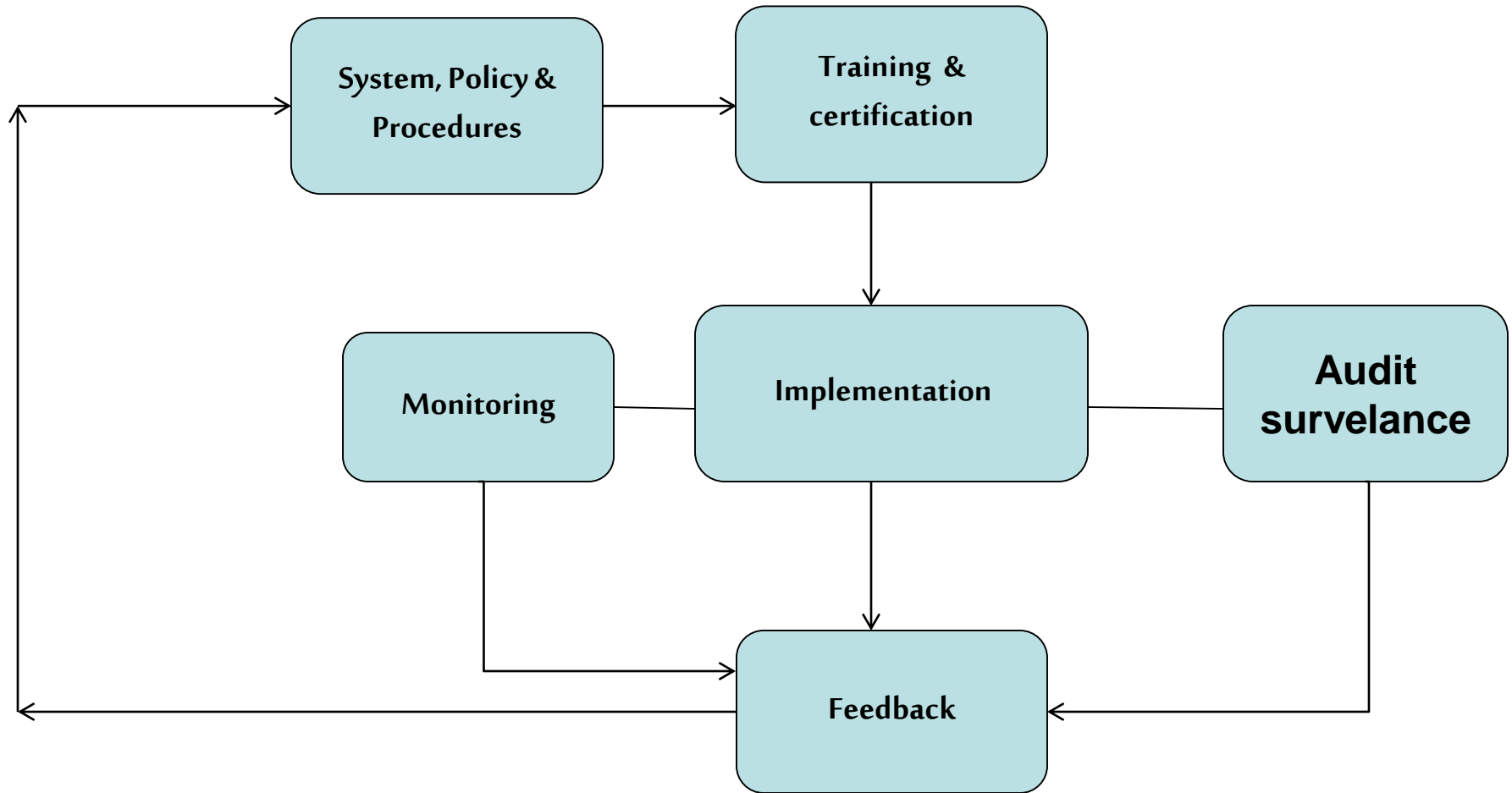
- Connected through V-Sat and GSM
- CNG Stations, DRS and CGS Inlet AOVs Controlled
- CNG Compressors, Dispensers Shutoff
- Monitoring of Pressure and Flows at more than 75 Points

5. Domestic :

- Service Regulator : Two stage, OPSO / UPSO
- Meter Regulator : UPSO
- Service Lines at 110 mBar (75% of PE Length)

PREVALENT SAFETY PRACTICES IN THE CGD SECTOR

Safety Practices Diagram



PREVALENT SAFETY PRACTICES IN THE CGD SECTOR

OPERATION & MAINTAINANCE :

- Setting up Area Emergency Offices (25,000 - 30,000 Dom. Conn per AEO's (9 AEO on Ahmedabad and 5 in Faridabad)

- Response time : Committed : 1 Hour
: **Achieved : Average 20 Minutes..**

- **Type of Maintenance :**
 - (1) Planned : Periodic Maintenance
: Safety Inspection

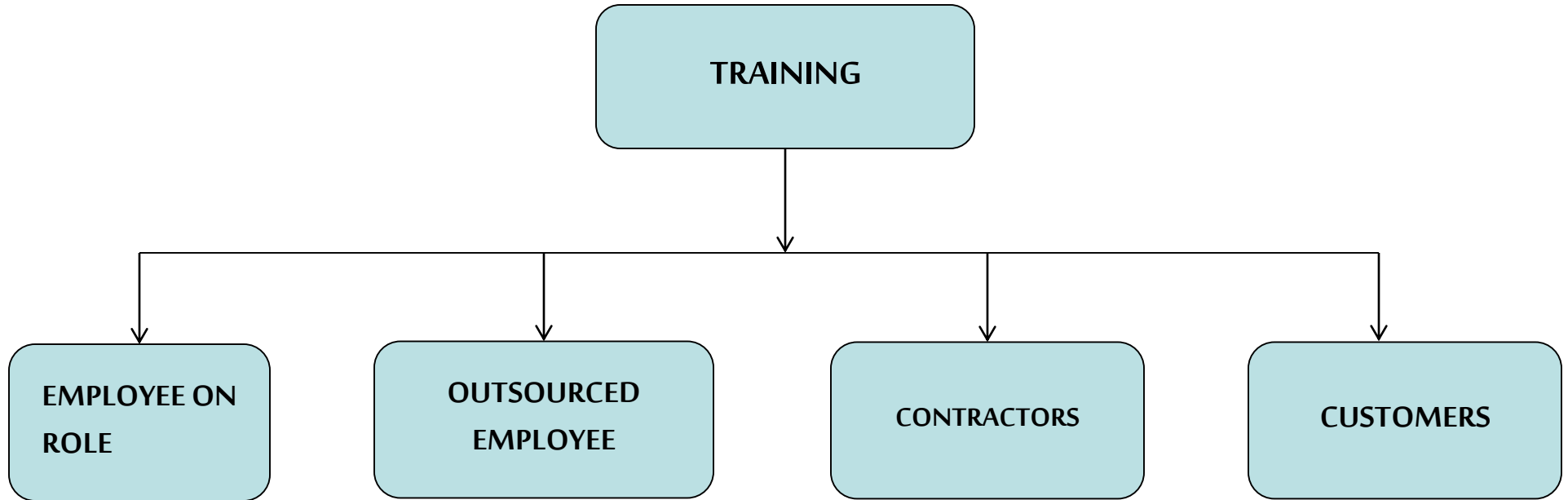
 - (2) Proactive Maintenance :
: **Preventive maintenance at the time of Diwali /
Holi festival**

PREVALENT SAFETY PRACTICES IN THE CGD SECTOR

(3) Unplanned Maintenance :

- Third party interventions
- Emergency
- Utility co-ordination with utility dept. through calling by respective AEO on every morning.

TRAINING



Apprenticeship – 3 months

STOC (Safety & Technical Operational Competency) Training

STOC training Welder / TPI certificate through PNGRB approved agency

- (1) Safety guideline at the time of commissioning
- (2) Safety briefing when visits at customer end.

AUDIT COMPLIANCE

- PNG Construction & commissioning : TPI / Engineers
- Safety audit (CNG stations / Comm / Ind) : Internal audit team
- Work place inspection :
 - (1) Engineers : Weekly
 - (2) Manager : Monthly
 - (3) HOD : Quarterly
 - (4) Asset head : Half yearly
- Safety audit : PNGRB approved TPI agency.
- System audit : Internal & External
 1. ISO 9001: 2008 for Quality Management System
 2. ISO 14001: 2004 for Environment Management System
 3. OHSAS 18001:2007 for Occupational Health & Safety Mgnt System

SAFETY ASPECTS OF DOMESTIC CONNECTION

1. DURING CONSTRUCTION :

➤ Route clearance :

- No overhanging & concealed line
- Safe distance from electrical appliances
- Shortest possible length - minimum joints .

➤ Installation work :

- License to Work
- Working at height : Safety belt, Fall arrester, Pedy-Gel
- Confined space : (1) Basement –Welded pipeline
(2) Bathroom - Cross ventilation mandatory.
- Manual boring : Electrically Insulated tools & tackles.
- **Warning mat inside the society.**

➤ Testing :

- Testing : (1) GI testing 4 bar @ 4 hours
(2) CU pipe testing 2 bar @ 4 hours
(3) PE Service line testing 6 bar @ 24 hours

SAFETY ASPECTS OF DOMESTIC CONNECTION

- **Tiers of testing** :
- (1) 1st tier : 100% testing witnessed by contractors for all pipes
- (2) 2nd tier : 100% testing witness by TPI's for all pipes
- (3) 3rd tier : 10% witness by Engineer / In charge

➤ **Commissioning & Conversion** :

- Leakage from existing burners
- Briefing the customers about do's & don't.
- Customer Call after satisfactorily completion of connection.

➤ **Internal Safety Inspection** :

- **Random Inspection of about 10% of total charged connections. Contractor Incentives linked to feedback.**

■ **Service verification** :

- **Product operational demonstration how, do's & don't & safety kit**

➤ **Maintenance after 5 years** :

- Replacement of all rubber components (O' ring & Suraksha Hose)
- 100% testing of GI / Cu pipe.

SAFETY ASPECTS OF DOMESTIC CONNECTION

- Addressal of leakages if any
- Riser joints testing i.e. Lateral parts.
- Identification of unauthorized tapping by
 - Meter readers
 - During maintenance

➤ Lock Pressure Test

➤ Domestic After Sales Service:

- **Post service test witnessed by TPI**



Thanks

CHALLENGES IN CGD BUSINESS

- Unavailability of qualified contractor in CGD – Big contractors are not coming.
- Contractor plumbers/welders turnover very high – once developed. Leave the existing contractor for better earning.
- Mindset of contractor's labors / plumbers/ welders - Careless approach – not to use safety equipment.
- Insufficient no's of vendors for materials such as Regulators / Meters / Pipes etc..
- Safety of Ind. / Comm connection - Internal pipeline installation when scope is of customer, they are reluctant.
- Mercaptans odour resembles with pesticide used in garden thus creating confusion among customers.
- Support from local Government and Municipal bodies,
- No provision for gas installation route in new building. Builders are not approaching while issuing BU permission, this should be one of criteria to get this cleared by gas company. Provision of safe gas route should be one of the criteria for issuing the fire NOC.
- Traffic condition

Safety of forecourt area at CNG Station

- Emergency master shut off valve installed at SS Tubing which can isolate the gas supply from CNG Storage area to Forecourt area.
- Isolation of electrical supply of individual dispenser as well as whole station can be done by SCADA control room.
- Isolation of inlet gas supply to the CNG Station can be done by SCADA Control room.
- Installed flame and gas detection system
- Injection of odorizing agent done to ensure perception of CNG gas leakage smell
- Ensure the layout of the CNG Station as per the approved plan of PESO and maintain inter distance as per the OISD 179.

Safety of forecourt area at CNG Station

- At the time of refuelling CNG in the vehicle, we check and ensure the following :
 1. Vehicles have approved type of CNG kit fitted in accordance with the guidelines of Ministry of Surface Transport, Govt. of India & PESO.
 2. Working closely with Transport Department to develop online system so that CNG Cylinder verification is done at the issuance / renewal of fitness certificate.
 3. Safety Technical And Competency Training given to all the filler, operator, supervisor, station operator, dealer at every year.
 4. Gas Quality verification at every CNG station.

Safety of Compressor

- Various safety device installed in the Compressor like
 1. Safety Relief Valve at each stage discharge, blow down vessel, suction line of compressor.
 2. Vibration switch
 3. Pressure transmitter
 4. Temperature transducers
 5. Gas Detector
 6. Flame Detector
 7. CO₂ flooding system
- Ensure the compressor operator and maintenance crew member are experienced to operate the compressor and training given to them at every year.
- Isolate the gas supply to the compressor through SCADA control room.

Safety of Compressor

- Ensure the flameproof electrical installation
- Maintenance of Compressor as per the OEM guideline and recommendation
- Inlet gas filter and discharge gas filter to ensure purity of gas
- Ensure follow of Do's and Don'ts for operating the compressor
- On site fire and safety training to compressor operator
- Actuator ball valve at outlet of compressor controlled by PLC of Compressor
- Isolation of electrical supply of compressor through SCADA control room for compressor shutdown in case of any emergency.
- 24 X 7 monitoring of various parameter and High Level Alarms through SCADA at Master Control Room.

Safety of Dispenser

- Emergency isolation valve at individual arm of the dispenser
- Isolation valve for cut of the gas supply to the dispenser
- Isolation of electrical supply of the dispenser through SCADA for any emergency
- Emergency push button to cut off the electrical supply
- Ensure electrical conductivity of hosepipe and checked the same on yearly basis.
- Replacement of electrical conductive refuelling hose at every 2 years.
- Replacement of NZS Probe “O” ring at every shift change over.
- Ensure breakaway coupling at individual refuelling hosepipe
- Ensure earthing (Prevent static charge) connection while filling the CNG.
- Safety Relief Valve at each arm

SCADA & AUTOMATION

- Installed Actuated Operated Valve to the inlet of each CNG stations, DRS and City Gas station for isolation through SCADA.
- Monitoring and control of each process parameters such as temperature, pressure & flow live parameter in single window.
- CGS(City Gate Station) main skid Flow control valve SET and CONTROL remotely as per requirement.
- Centralized remote change of CNG dispenser unit rate from SCADA control room.

