



Checklist for PNGRB (Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks) Regulations, 2008



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Team composition & No. of facilities to be inspected

Sr. No.	Name of the Facility	Minimum No. of Auditors	No. of sample to be audited
1	City Gate Station (CGS)	2/3	All the CGS to be inspected. In case of 1 CGS, all the three auditors shall visit the CGS facility. For more than 1CGS, minimum 2 auditors shall visit the CGS facility.
2	District Pressure Regulating Station (DPRS)	2	i. Upto 20 DPRS, minimum 2 shall be inspected ii. From 20-50 DPRS, minimum 3 shall be inspected iii. For > 50 DPRS, minimum 4 shall be inspected
3	CNG Stations	2	i. Upto 20 stations, minimum 2 shall be inspected ii. From 20-50 stations, minimum 3 shall be inspected iii. From 50-100 stations, minimum 4 shall be inspected iv. For, > 100 stations, minimum 5 shall be inspected
4	Domestic Consumer	1	i. For, < 1000 customer, minimum 5 shall be inspected ii. For, > 1000 customer, minimum 10 shall be inspected.
5	Commercial Consumer	1	5 customers shall be inspected.
6	Industrial Consumer	2	5 customers shall be inspected preferably with different set of modules/ Requirements.

Note:

- (a) An audit team shall consist of minimum three (3) auditors with atleast 2 nos. of auditors with minimum 5 experience of operation / maintenance in CGD network facilities/ natural gas pipeline and other auditor (s) should have at least 5 years of working experience in operation, maintenance, safety etc. in oil and gas industry.
- (b) The team composition alongwith resume shall be submitted to PNGRB at least one week before the scheduled dates of audit.

- (c) All observations w.r.t. deviations from regulations shall be captured in the inspection report and key observations directly impacting the continuance of operation in safe manner shall be reported through an e-mail to PNGRB within 24 hrs. of completion of audit.*
- (d) Level-II Mock-Drill shall be conducted in all T4S inspections.*
- (e) A total of 3 days audit shall be conducted for each GA irrespective of its size.*
- (f) CNG station stations shall be selected of different type i.e. Mother, Online, Daughter, Daughter-Booster, co-located with MS, HSD, etc.*
- (g) Mock drill shall be conducted at CNG station also.*
- (h) For commercial and Industrial consumer, all type of skids shall be inspected including wall mounted.*
- (i) Steel network and PE network shall be checked parallelly at the sites where construction and installation activities are going on.*

(i) GENERAL

Sl. No.	Particulars	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Name of the CGD Entity			
2	Head office Address for Communication Telephone No. (0265) 2334073/74/75 E-mail ID			
3	Control Room/Rooms Address Telephone No. E-mail ID			
4	Details of Geographical Area:			
5	Total no. of CGS / Terminal			

6	No. of Pressure Regulating Installations/DPRS (excluding consumer owned IPRS)			
7	Source/Sources of Supply of Gas			
8	Maximum operating pressure of the network (Primary, Secondary and Tertiary)			
9	No. of mainline isolation valves in Steel Pipe Line Network & in PE Pipe Line Network			
10	No. of Major crossings (River)			
11	No. of cased crossings - Railway/Highways			
12	No. of CP stations (TR units)			
13	Nos. of TLP & Spacing			
14	Important Facilities in the GA			

Sl. No.	Particulars	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	(a) Fire station/Stations			
	(b) Police station/Stations			
	(c) Hospital/Medical			
	(d) Major Industries/Mutual Aids			
15	Is the installation layout with inter distances for CGS available? Lay Out No.			
16	Does the above layout confirms to PNGRB T4S for CGD networks, Table-1			
17	Power system details for CGS (Data card shall be maintained):			
	(a) Transformer rating & type			
	(b) HT/LT breaker Type and Rating			
	(c) DG set details (Make, Capacity etc.)			
18	Communication system details from Control room to field locations			
	(a) Telephone with STD Code			
	(b) VHF / Walkiee Talkie			
	(c) CCTV			

	(d) Others			
19	Verify the validity of the following licenses?			

Sl. No.	Particulars	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	(a) Environment Pollution Control Board for Air and Water			
	(b) Weights and Measures approval certificate for consumer meters (Alternatively verification of PNGRB T4S referenced standard (like EN or OIML)			
	(c) HF/VHF license			
	(d) Clearance from electrical authorities			
	(e) Factory & labour license			
	(f) Environment clearance from Ministry of Environment, Forest and Climate Change			
	(g) Statutory approval from local authorities such as Fire, Municipal Corporation, District Admin, PESO etc.			
20	Whether following manuals/standards are available with the entity			
	(a) EPA 1986 and rules			
	(b) Weights and measure rules Act			
	(c) Operating manual including start up, shut down and			
	(d) emergency Response and disaster management plan			
	(e) safety manual			

	(f) PNGRB Act and other documents as specified in			
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Sl. No.	Particulars	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	T4S			
	(g) codes to which pipeline has been designed, constructed and maintained			
	(h) Equipment manufacturers manuals for all equipments Such as for Compressors, DG, DPRS, DU, Cascade etc.			
21	Whether risk analysis of the facility has been carried out and recommendations implemented?			
22	Whether adequate safety devices / interlocks (like SSV, SRV) have been provided, tested and documented. Major safety interlocks to be mentioned?			
23	Whether lines have been painted and separate colors have been provided for different services?			
24	Whether list of contact persons have been displayed with telephone numbers?			
25	HSE Management system consisting visitors safety brief, accident reporting, do & don't for consumers, ERDMP in place?			

(ii) CRITICAL ACTIVITIES IN CGD NETWORK

Sr. No.	List of Activity	If no, Implementati on Plan	Time period for Implement	Status of implementation	Recommendations	Criticality level (HH/H/M/L)
1	Verify whether the Pressure Reduction skid CGS installed having (Active/monitor combination) with a minimum 50% redundancy including slam shut valve for over-protection and creep relief valve					
2	Verify whether the On-line odorization equipment designed to minimize fugitive emissions during loading, operation and maintenance					
3	Verify whether the Height of the vent minimum 3 meters above working level					
4	Verify whether the Gas detectors are installed at critical locations					
5	Verify whether Pressure reduction for DPRS (active/ monitor combination) skid installed with minimum 50% redundancy including two safety devices at least one of then shall be a slam shut valve for over pressure protection/under-pressure and inlet and outlet isolation valve					
6	Verify whether Steel reinforced rubber hoses conforming to IS 9573 Type II					
7	Verify whether the pipeline test records, Joint radiography and cover available in the form of pipe book					
8	Verify whether the HSSE Management system in place					

9	Verify availability of following records: Emergency Response Plan, Disaster Management Plan and written emergency procedures. For an Emergency Control					
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	Room, manned round the clock and equipped with effective communication system and emergency vehicles equipped or provided with communication facilities, first aid equipment, fire extinguishers, gas detectors, repair kits and tools, maps, plans, material safety data sheets etc. at its disposal.				
10	Verify whether the GIS based asset management system is available for CGD Network				
11	Verify whether the Domestic Gas Stoves using PNG as fuel conforming to IS:17153				

(iii) SUB TRANSMISSION PIPELINE (STPL)

Sl. no.	Parameters	Details / Observations			Recommendations	Criticality level (HH/H/M/L)
1	Supply/Source Point/tap-off Point					
2	Location of STPL					
3	Owner of STPL					
4	Total Length of STPL upto City Gate Station (in kms)					
5	Verification of Pipeline MOP and MAOP (in barg)					
Schedule-1A (Sr. No. 6,7,8 To be checked in 1 st Audit only)						
6	Verification of Piping materials and Equipment manufactured to standards listed in Annexure-I and Annexure-II					
7	Verify the Carbon equivalent					
8	Verify whether the notch toughness is specified for carbon steel pipes of Size NPS 2					
9	Verify whether ductile iron pipe is not used in CGD Network					
10	Verify whether reinforced thermoplastic pipes (RTP) or multi layered thermoplastic pipes, if used, is complying with requirements specified in sub-clause a. to g.					
Schedule-1 B (Sr. No. 11 to 16 to be checked in 1 st Audit)						

Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
11	Verify the Welding procedures and welder qualification procedure.			
12	Verify that all NDT including radiography examination performed.			
13	Verify that All carbon steel butt welds are 100% radiographed.			
14	Verify whether ultrasonic testing is done If Radiography is not possible due to safety reasons			
15	Verify whether defect is repaired			
16	Verify whether additional radiography or ultrasonic testing is done after repair			
Schedule-1 C				
17	Check whether valve body, bonnet, cover and/or end flanges and fittings are not made from cast iron and ductile iron.			
18	Verify whether mechanical fitting for making hot taps is not used			
19	Verify whether flanges are not used in pipeline network except for station piping e.g. CGS, DPRS, MRS etc.			
Schedule -1D (Sr. No. 25, 27, 28, 29, 37, 38, 48 to be checked in 1st Audit)				
20	Verify whether the Pipe is not used of below 6.4 mm thickness			

21	Verify whether the Quantitative Risk Assessment is carried out and the risk level is reduced to ALARP, if thickness is used below 6.4 mm			
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Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
22	Verify whether the minimum cover requirements and clearances are provided as per Table-3 of PNGRB T4S CGD Regulations.			
23	Verify whether the minimum cover requirements is not maintained due to site constraints, then additional protection in form of casing/concreting etc. is provided			
24	Verify whether the pipeline on bridges is avoided except extreme/unavoidable condition			
25	Verify whether design factor 0.40 For location class 4 is used for pipeline installed under unavoidable condition on rail road, vehicular, pedestrian or other pipeline bridge			
26	Verify whether suitable barricades/crash guards is installed for pipeline protection from accidental damages due to vehicular traffic			
27	Verify whether specific gravity of resulting installation by anti-buoyancy measures for under water area pipe line is 1.10 or more			
28	Verify whether specific gravity of resulting installation by extra anti-buoyancy measures for under water area (subject to flooding i.e. lakes, bays, swamps) pipe line is 1.20 or more			
29	Verify whether buried steel pipeline is laid at least 300 mm clear distance below from the existing utilities like cable, drain, existing pipe line			
31	Verify whether the minimum 03 meter separation is maintained between the steel pipe			

Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	line and footing of transmission tower			
32	Verify whether clear distance between newly laid pipeline and existing pipeline is maintained minimum 03 meters			
33	Verify whether clear separation of minimum 500 mm between adjacent pipeline is maintained, if laying more than one new hydrocarbons pipelines or mains in same trench			
34	Verify whether steel pipeline or main is not located within 03 meters of any habitable dwelling or any industrial building			
35	Verify whether the additional cover of at least 300 mm over and above or special protective measures such as concrete slab, steel casing are provided, if not possible to maintain the distance, given in point no.34			
36	Verify whether the statutory approval is taken prior to construction of steel casing			
37	Verify whether Casing Pipe diameter is used minimum two pipe sizes bigger than carrier pipe of career pipe			
38	Verify whether Casing Pipe thickness is used as per Appendix C of API-1102			
39	Verify whether angle of intersection between pipeline crossings and the rail road or highway to be crossed should be as near to 90 degree as practicable. In no case should it be less than 30 degree.			

Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
40	Verify whether Steel Casing Pipe cover is as per clause 5.7.1, 5.7.2 or 5.7.3 of API-1102			
41	Verify whether casing seals are provided at both ends to reduce the intrusion the water and fines from the surrounding soil			
42	Verify whether test stations with test leads attached to the Carrier pipe and casing Pipe and monitoring is done carefully			
43	Verify whether miters bends and wrinkle bends are not used in pipe lines			
44	Verify whether cold field bend radius is used 40 times the Pipe diameter for pipe size NPS 20 and larger			
45	Verify whether special design and construction methodologies adopted through experienced personnel/consultant and approval is taken by entity from the PNGRB, if not possible to maintain the clearances, cover, vent locations etc.			
46	Verify whether the Hot taps design and construction is carried out as per API RP2201, ASME B 31.4, API 1104 Appendix B			
47	Verify whether the duly filled checklist stated in API RP-2201 is available			
48	Verify whether welding procedure specification and welder qualification is verified before hot tapping			
49	Verify whether the full bore valve is used when making branch connections using hot taps.			

Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
50	Verify whether buried steel pipelines or mains is tested after installation using water as a test medium at 1.4 times MAOP for minimum 24 hours for underground and 04 hours for aboveground pipeline			
51	Verify the test records post construction such as Testing Reports, Joint Coating Report, back-filling reports, Pipe book are in place.			
Schedule -1E				
52	Verify that the O&M procedure are developed and followed.			
53	Verify the mode of inspection followed by Entity like patrolling/ line walk/ any other means			
Schedule -1F				
54	Verify whether All buried bends and fittings are coated with heat shrink sleeves or two pack high build epoxy coating with minimum 450 microns			
55	Verify whether Insulating Joint is properly rated for temperature, pressure, and electrical properties and resistant to the natural gas			
56	Verify whether Insulating Joint is not installed in enclosed areas			
57	Verify whether the PSP monitoring is done on defined frequency at all test lead points			
58	Verify whether the polarized pipe to soil potential values are within the prescribed limit (-0.85 V to -1.5 V)			

Sl. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
59	Verify if Pipe to Soil Potential values is not within limit, then specify the actions taken by entity			
60	Verify whether all records related to corrosion control stated in T4S Regulations are maintained			
61	Verify whether sacrificial anodes system is installed till the impressed current Cathodic Protection system is commissioned.			

(iv) STEEL DISTRIBUTION NETWORK

Sr. no.	Parameters	Details / Observatio	Recommendations	Criticality level (HH/H/M/L)
1	Total Length of Steel distribution network (in kms)			
2	Verification of Pipeline MOP and MAOP (in barg)			
Schedule-1A (Sr. No. 3, 4, 5 to be checked in 1st Audit)				
3	Verification of Piping materials and Equipment manufactured to standards listed in Annexure-I and Annexure-II			
4	Verify the Carbon equivalent			
5	Verify whether the notch toughness is specified for carbon steel pipes of Size NPS 2			
6	Verify whether ductile iron pipe is not used in CGD Network			
7	Verify whether reinforced thermoplastic pipes (RTP) or multi layered thermoplastic pipes, if used, is complying with requirements specified in sub-clause a. to g.			
Schedule-1B (Sr. No. 8 to 13 be checked in 1st Audit)				
8	Verify the Welding procedures and welder qualification procedure.			
9	Verify that all NDT including radiography examination performed.			
10	Verify that All carbon steel butt welds are 100% radiographed.			
11	Verify whether ultrasonic Testing is done If Radiography is not possible due to safety reasons			
12	Verify whether defect is repaired			
13	Verify whether additional radiography or ultrasonic testing is done after repair			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
Schedule-1 C				
14	Check whether valve body, bonnet, cover and/or end flanges and fittings are not made from Cast iron and ductile iron.			
15	Verify whether mechanical fitting for making hot taps is not used			
16	Verify whether flanges is not used in pipeline network except for station piping e.g. CGS, DPRS, MRS etc.			
17	Verify whether flanges is used with raised face for piping class 150 or above			
Schedule -1D (Sr. No. 18, 25, 26, 27, 33, 35, 36, 37, 41, 43, 45 to be checked in 1st Audit)				
18	Verify whether the pipe is not used of thickness below 6.4 mm			
19	Verify whether the Quantitative Risk Assessment is carried out and the risk level is reduced to ALARP, if thickness is used below 6.4 mm			
20	Verify whether the minimum cover requirements and clearances as per PNGRB technical standard and specification, Table-3.			
21	Verify whether the minimum cover requirements is not maintained due to site constraints, then additional protection in form of casing/Concreting etc. is provided			
22	Verify whether the pipeline on bridges is avoided except extreme/unavoidable condition			
23	Verify whether design factor 0.40 For location class 4 is used for pipeline installed under unavoidable condition on rail road, vehicular, pedestrian or other			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	pipeline bridge			
24	Verify whether suitable barricades/crash guards is installed for pipeline protection from accidental damages due to vehicular traffic			
25	Verify whether specific gravity of resulting installation by anti-buoyancy measures for under water area pipe line is 1.10 or more			
26	Verify whether specific gravity of resulting installation by extra anti-buoyancy measures for under water area (subject to flooding i.e. lakes, bays, swamps) pipe line is 1.20 or more			
27	Verify whether buried steel pipeline is laid at least 300 mm below the utilities like cable, drain, existing pipe line			
28	Verify whether buried steel pipeline is laid at least 300 mm clear distance below from the existing utilities like cable, drain, existing pipe line			
29	Verify whether the minimum 03 meter separation is maintained between the steel pipe line and footing of transmission tower			
30	Verify whether clear distance between newly laid pipeline and existing pipeline is maintained minimum 03 meters			
31	Verify whether clear separation of minimum 500 mm between adjacent pipeline is maintained, if laying more than one new hydrocarbons pipelines or mains in same trench			

32	Verify whether steel pipeline or main is not located within 03 meters of any habitable dwelling or any			
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Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	industrial building			
33	Verify whether the additional cover of at least 300 mm over and above or special protective measures such as concrete slab, steel casing are provided, if not possible to maintain the distance, given in point no. 33			
34	Verify whether the statutory approval is taken prior to construction of steel casing			
35	Verify whether casing pipe diameter is used minimum two pipe sizes bigger than carrier pipe of carrier pipe			
36	Verify whether angle of intersection between pipeline crossings and the rail road or highway to be crossed should be as near to 90 degree as practicable. In no case should it be less than 30 degree.			
37	Verify whether Steel Casing Pipe cover is as per clause 5.7.1, 5.7.2 or 5.7.3 of API-1102			
38	Verify whether casing seals are provided at both ends to reduce the intrusion the water and fines from the surrounding soil			
39	Verify whether test stations with test leads attached to the carrier pipe and casing pipe and monitoring is done carefully			
40	Verify whether miters bends and wrinkle bends are not used in pipe lines			
41	Verify whether cold field bend radius is used 40 times the pipe diameter for pipe size NPS 20 and larger			

42	Verify whether special design and construction methodologies adopted through experienced			
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Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	personnel/consultant and approval is taken by entity from the PNGRB, if not possible to maintain the clearances, cover, vent locations etc.			
43	Verify whether the hot taps design and construction is carried out as per API RP2201, ASME B 31.4, API 1104, Appendix- B			
44	Verify whether the duly filled checklist stated in API RP-2201 is available			
45	Verify whether Welding procedure specification and welder qualification is verified before hot tapping			
46	Verify whether the full bore valve is used when making branch connections using hot taps.			
47	Verify whether buried steel pipelines or mains is tested after installation using water as a test medium at 1.4 times MAOP for minimum 24 hours for underground and 04 hours for aboveground pipeline			
48	Verify the test records post construction such as Testing Reports, Joint Coating Report, back-filling reports, Pipe book are in place.			
49	Verify whether the spacing between valves on distribution mains are maintained as per PNGRB technical standard			
Schedule-1E				
50	Verify that the O&M procedure are developed and followed.			
51	Verify the mode of inspection followed by Entity like patrolling/ line walk/ any other means? And frequency is maintained			
52	Verify marker position by maximum spacing 100			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	meters in urban area and 200 meters within industrial parks for steel mains			
53	Verify whether markers are marked in bold and legible local language			
54	Verify whether highly congested areas are surveyed using gas detectors at least once in 03 months and other area at least once in a year			
55	Verify whether steel pipelines and mains used in CGD Network is not used for dual service			
Schedule -1F				
56	Verify whether all buried bends and fittings are coated with heat shrink sleeves or two pack high build epoxy coating with minimum 450 microns			
57	Verify whether insulating joint is properly rated for temperature, pressure, and electrical properties and resistant to the natural gas			
58	Verify whether insulating joint is not installed in enclosed areas			
59	Verify whether the PSP monitoring is done on defined frequency at all test lead points			
60	Verify whether the polarized pipe to soil potential values are observing within the prescribed limit (-0.85 V to - 1.5 V)			
61	Verify if Pipe to Soil Potential values are not within limit, what action is taken by entity			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
62	Verify whether sacrificial anodes system is installed till the impressed current Cathodic Protection system is commissioned			
63	Verify whether cathodic protection system is maintained			
64	Verify whether all records related to corrosion control stated in T4S CGD Regulations are maintained			

(v) CITY GATE STATION (CGS)

Sr. No.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Identification of PRI at CGS			
2	Location of CGS / Terminal			
3	Connectivity Details			
4	Gas Flow Rate			
5	ANSI Pressure class			
Schedule-1 A (Sr. No. 6 to be checked in 1st Audit)				
6	Verification of piping materials and Equipment manufactured to standards listed in Annexure-I and Annexure-II			
Schedule-1 B (Sr. No. 7 & 8 to be checked in 1st Audit)				
7	Verify the Welding procedures and welder qualification procedure.			
8	Verify that all NDT including radiography examination performed.			
Schedule-1 C				
9	Check whether Valve Body, Bonnet, cover and/or end flanges and fittings are not made from Cast Iron and Ductile iron.			
Schedule -1D (Sr. No. 12, 30 to be checked in 1st Audit)				
10	Check whether the Properly laid out roads around various facilities is provided within the installation			
11	Check whether the facility is provided with proper boundary wall/fencing with Gate(s) in line with MHA (Ministry of Home affairs)			
12	Check whether the depth of top cover of buried pipe line inside the CGS is minimum 1.2 meter			

Sr. No.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
13	Whether CGS is installed with configuration specified in PNGRB T4S CGD Regulations at Table-1			
14	Check whether the platforms and crossovers is provided where required			
15	Verify whether the Minimum 50% redundancy of Pressure Reduction Skid is available			
16	Verify whether the gas filtration facilities with 100% redundancy is provided			
17	Verify weather provision is made for venting, purging, and draining for isolation during construction or maintenance			
18	Verify whether the vent line is terminated at minimum height of 3 meters above the working level			
19	Verify whether the distance between vent and boundary wall/Fencing 05 meter.			
20	Verify whether the vent line is terminated in Safe area *(Vent opening should have top cover to avoid chocking) ** (Bend/Elbow above 90 deg. at vent Opening is not permitted to avoid venting Gas in return Direction)			
21	Verify whether the Gas detectors are installed			
22	Verify whether the all facilities handling Gas are located downwind from Heaters, in case of fired Gas Heaters required and used			
23	Verify whether the Facilities are connected with Earthing System & Monitoring is being done as per IS 3043			
24	Verify whether the Electrical Equipment are installed in			

Sr. No.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	line with IS 5571			
25	Verify whether the Lightning protection is provided as per IS/IEC 62305?			
26	Verify whether the Upstream Dry Gas Filter(s) is/are installed when rotary or turbine meters used			
27	Verify whether the quick closing valve (with Remote operation facility) is installed in inlet of unmanned CGS			
28	Verify whether the adequate instrumentation and control system are in place.			
29	Verify whether the underground Coated Steel Pipe continue at least 300 mm above ground			
30	Verify whether the testing of piping is done before commissioning			
31	Verify whether the pressure sound level does not exceed the limit prescribed by Environmental Authorities or 110 dBA.			
Schedule-1E				
32	Verify that the O&M procedure are developed.			
33	Verify whether the calibration plan for meters, gauges and other safety instruments installed in DPRS, is available			
34	Verify whether the plan for functional testing of pressure regulation and control equipment (Active/Monitor Regulator, Slum Shut Valve, Pressure Relief Valves and Control Valves etc.) is available.			

35	Verify whether the limits of Operating Parameters (Pressure, Temperature, flow, Levels etc.) are established in O&M procedure and set in equipments			
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Sr. No.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
Schedule-1G				
36	Verify whether online odourisation equipment has been installed and odourisation system is in working condition			
37	Verify whether odorizing equipment is located in a separate area at CGS			
38	Verify whether 1.5 meter distance around the odorizing and other facilities is maintained			
39	Verify whether maintenance is done of odourisation system			
40	Verify whether a pre – determined quantity of suitable odorant is dosed into the gas stream.			
41	Verify whether quantity of odorant dosing is safe for human as well as materials and equipments used in CGD system			
42	Verify whether odour level test is carried out at various defined locations and at extreme ends of network			
43	Verify whether corrective action is taken, in case of odour levels falls below the acceptable levels			
44	Verify whether odourant absorber like Activated Carbon saw dust, dry sand and odorant neutralizer like sodium hypochlorite is provided			
45	Verify whether provision is made for eye wash or emergency shower near odorant handling and injection systems, in case of ethyl mercaptan is used as odourant.			
46	Verify whether PPE like face shield, mask, rubber hand gloves, gumboot, safety goggles etc. is available			

(vi) DPRS/IPRS

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Identification			
2	Location of PRI(s)			
3	Connectivity Details			
4	Gas Flow Rate			
5	ANSI Pressure class			
6	No. of PRI			
7	Verification of Pipeline MOP and MAOP (in barg)			
Schedule-1 A (Sr. No. 8 to be checked in 1st Audit)				
8	Verification of piping materials and Equipment manufactured to standards listed in Annexure-I and Annexure-II			
Schedule-1 B (Sr. No. 9 & 10 to be checked in 1st Audit)				
9	Verify the Welding procedures and welder qualification procedure.			
10	Verify that all NDT including radiography examination performed.			
Schedule-1 C				
11	Check whether valve body, bonnet, cover and/or end flanges and fittings are not made from cast iron and ductile iron.			
Schedule -1D (Sr. No. 34 to be checked in 1st Audit)				

12	Check whether the DPRS located belowground or aboveground?			
13	Verify whether the Enclosed Chamber with provision of entry or buried Hermetically Sealed module type chamber with proper cathodic protection is provided,			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	incase of underground DPRS			
14	Verify whether the active and Monitor combination is available in DPRS			
15	Verify whether the minimum 50% redundancy of pressure reduction skid is available			
16	Verify whether the Gas Filtration Facilities with 100% redundancy is provided			
17	Verify weather provision is there for venting, purging, and draining for isolation during Construction or maintenance			
18	Verify if the butterfly valves are used in underground DPRS, it conforms to the requirements given in Annexure – I			
19	Verify whether a dedicated isolation valve is installed upstream of underground DPRS skid.			
20	Verify whether the vent line is terminated at minimum height of 3 meters above the ground level (In case of Underground DPRS) or above the working level (In case of Aboveground DPRS)			
21	Verify whether the vent line is terminated in Safe area *(Vent opening should have top cover to avoid chocking) ** (Bend/Elbow above 90 deg. at vent Opening is not permitted to avoid venting Gas in return Direction)			
22	Verify whether the aboveground DPRS/IPRS is installed with proximity not less than 2 meters from nearest structure/ building as per PNGRB technical standard			
23	Verify whether safety features like crash guards, caging			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	of facilities and like other facilities provided and maximum outlet pressure is restricted up to 2.0 bar (g) for wall mounted regulating system			
24	Verify whether the Gas detectors are installed			
25	Verify whether the fencing is provided to above ground DPRS or not?			
26	Verify whether the all facilities handling Gas are located downwind from heaters, in case of fired Gas Heaters required and used			
27	Verify whether the DPRS is connected with Earthing System & Monitoring is being done as per IS 3043			
28	Verify whether the Electrical Equipment are installed in line with IS 5571			
29	Verify whether electrical area classification of installation is done as per IS-5572			
30	Verify whether the isolation valve is provided at inlet & outlet of DPRS and easy accessible to operation			
31	Verify whether the isolation valve is provided in Piping at inlet & outlet of DPRS and easy accessible to operation			
32	Verify whether the upstream dry gas filter(s) is/are installed when rotary or turbine meters used			
33	Verify whether the underground Coated Steel Pipe continue at least 300 mm above ground			
34	Verify whether the testing of piping is done before Commissioning			
35	Verify whether the pressure sound level does not exceed the limit prescribed by Environmental			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	Authorities or 110 dBA			
Schedule-1E				
36	Verify that the O&M procedure are developed			
37	Verify whether the calibration Plan for Meters, Gauges and other safety instruments installed in DPRS, is available			
38	Verify whether the Plan for functional testing of pressure regulation and control equipment (Active/Monitor Regulator, Slum Shut Valve, Pressure Relief Valves and Control Valves etc.) is available.			
39	Verify whether the limits of operating parameters (Pressure, Temperature, flow, Levels etc.) are established in O & M procedure and set in equipments			

Note---1. Separate Checklist to be filled for every inspected DPRS

2. Checklist to be filled also for every inspected IPRS

3. Refer Annexure-I and Annexure-II for material details for various components.

(vii) PE NETWORK

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Verification of total length of PE Distribution network (in kms)			
2	Verification of Pipeline MOP and MAOP (in barg)			
Schedule-1A (Sr. No. 3 to be checked in 1st Audit)				
3	Verification of piping materials and Equipment manufactured to standards listed in Annexure-I and Annexure-II			
4	Verify whether the reprocessed material is not used during pipe manufacturing			
5	Verify whether the colour of pipe used for Natural gas service is yellow for PE 80 grade and orange for PE 100 grade.			
6	Verify whether permanent marking is impressed or embossed to a depth/height of 0.02 to 0.15 mm			
7	Verify whether PE Pipe is not used for above ground gas pipes			
8	Verify that if PE Pipe re-used then are Pipe traceability, documents, free from visible defects, re-testing verified by the entity			
Schedule-1 C (Sr. No. 13, 14 to be checked in 1st Audit)				
9	Verify whether thermoplastic fittings conforming to ISO 4437 Part 3 or EN 1555 Part 3 is used in CGD network			
10	Verify whether the electro-fusion fittings are as per ISO 8085 Part-3 / EN 1555-3 and fittings fabricated from pipe is not used			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
11	Verify whether each electro fusion fitting is bar coded and have permanent fusion indicator or a data card conforming to ISO-7810/ISO- 7811			
12	Verify whether the fusion jointing is carried out as per the procedure outlined in the standard DVS 2202 or equivalent			
13	Verify whether all plastic fittings have been type tested by internationally recognized testing agency prior to use			
14	Verify whether thermoplastic/thermosetting fittings is not used in above ground piping system			
15	Verify whether fittings fabricated from pipes is not used			
16	Verify whether the colour of fittings is yellow or black			
17	Verify whether polyethylene resins used for thermoplastic fittings is virgin, cadmium free pigmented compound. Anti-oxidant and UV Stabilizers are meeting the requirements as per EN 1555-1, and ISO 4437-1			
18	Verify whether mechanical fittings for making hot taps on thermoplastic mains and service lines is electro fusion type			
Schedule -1D (Sr. No. 19, 20, 21, 24, 29 to be checked in 1st Audit)				
19	Verify whether Pipe thickness is not less than 2.3 mm and selected from SDR Table-4			
20	Verify whether pipe with non-standard SDR is not used			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
21	Verify whether buried service lines are provided with a minimum cover of 1.0 m.			
22	Verify whether additional protective measures such as concrete slabs or high impact resistance plastic sheets is installed at least 300 mm above the service line where it is impractical to provide 1.0 m cover due to physical constraints			
23	Verify whether the depth of cover is not less than 600 mm			
24	Verify whether wall thickness of the fittings is more or equal to the wall thickness of the pipe jointed			
25	Verify whether warning tape of yellow colour 200 mm above the pipe is laid where open cut trench technique used			
26	Verify whether trench width during laying is at least 300 mm			
27	Verify whether threaded joints/butt fusion method/solvent cement method/adhesive method/heat fusion method/compression couplings method/flange method, in plastic pipe is not used, only electro fusion fittings joint is made			
28	Verify whether the bed of trench is free of sharp object, stones and in rocky areas trench is padded with soft soil or sand to minimum depth of 150 mm below the pipe			
29	Verify the procedure for Hot taps installation is available			
31	Verify whether Special saddle or split tee type electro fusion fittings is used during hot tapping.			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
32	Verify that test medium is used air/nitrogen for test pressure 100 psig and water for higher than 100 psig			
33	Verify that test duration is minimum 24 hours for greater than 1 km section length and minimum 04 hours for shorter than 1 km section length			
34	Verify whether the adequate safety i.e. relief valve, relevant warning signs, deployment of Emergency response plan is adhered during testing.			
35	Verify the test records post construction i.e. testing reports, back filling reports, pipe book are in place.			
36	Verify whether the spacing between valves on plastic distribution mains are maintained as per PNGRB technical standard			
37	Verify whether plastic service lines is not installed under or inside the building			
38	Verify whether the valves are installed on the inlet and outlet piping of each regulator station controlling flow or pressure of gas in distribution system			
Schedule -1E				
39	Verify that the O&M procedure are developed.			
40	Verify the mode of inspection followed by Entity like patrolling/ line walk/ any other means? and frequency maintained			
41	Verify whether highly congested areas is surveyed using gas detectors at least once in 03 months and other area at least once in a year			

(viii) INDUSTRIAL CONSUMERS

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Verification of total number of Connections (in nos.)			
2	Verification of Pipeline MOP and MAOP (in barg)			
Schedule-1 A (Sr. No. 3 to be checked in 1st Audit)				
3	Verification of piping materials and Equipment manufactured to PNGRB technical standards and specifications listed in Annexure-I, Annexure-II and Annexure-IV			
4	Verification of steel reinforced rubber hose to IS: 9573 Type II			
5	Verify the Rubber Hose length is used maximum 1.5 meter			
6	Verify whether both end of Rubber Hose is firmly clamped on the nozzles by metallic clamps			
Schedule-1 C				
7	Check whether valve body, bonnet, cover and/or end flanges and fittings are not made from Cast iron and ductile iron.			
Schedule -1D (Sr. No. 9 to be checked in 1st Audit)				
8	Verify the procedure for plastic pipe and tubings joints and connections is in place.			
9	Verify whether the testing is done before commissioning			
10	Verify the test records post construction is in place.			
11	Verify whether the location of customer's meter and regulator installation are made safe manner.			
12	Verify if meter is installed outside the premises then			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	protection by steel fencing is provided			
13	Verify whether the PNGRB (Gas Supplies to Industrial, Commercial Customers) Guidelines, 2020 is complied, if natural ventilation is not available			
14	Verify whether the vent line is terminated at minimum height of 3 meters above the ground level			
Schedule -1E				
15	Verify that the O&M procedure are developed and followed.			
Schedule -1F				
16	Verify whether above ground pipe line is protected from corrosion.			

NOTES: Refer Schedule 1D of CGD technical standard:

- ✓ **Customer IPRS installation shall be independently approved by certified third party agency before the entity supplies the gas.**
- ✓ **Recertification shall be carried out once in 3 years.**

(ix) DOMESTIC AND COMMERCIAL CONSUMERS

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Verification of total number of Connections (in nos.)			
2	Verification of Pipeline MOP and MAOP (in barg)			
Schedule-1 A (Sr. No. 3 to be checked in 1st Audit)				
3	Verification of piping materials and Equipment manufactured to PNGRB technical standards and specifications listed in Annexure-I, Annexure-II and Annexure-IV			
4	Verification of steel reinforced rubber hose to IS: 9573 Type II			
5	Verify the Rubber Hose length is used maximum 1.5 meter			
6	Verify whether both end of Rubber Hose is firmly clamped on the nozzles by metallic clamps			
7	Verify whether Domestic Gas Stoves using PNG as fuel conforms to IS:17153?			
Schedule-1 C				
8	Check whether valve body, bonnet, cover and/or end flanges and fittings are not made from Cast iron and ductile iron.			
Schedule -1D (Sr. No. 3 to be checked in 1st Audit)				
9	Verify the procedure for Plastic pipe and tubing joints and connections is in place.			
10	Verify the test records post construction is in place.			
11	Verify whether transition fittings is used for transition from plastic pipe to GI pipe			

12	Verify whether plastic part of transition fitting protruding above ground is protected by encasing it with concrete guard.			
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Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
13	Verify whether carbon steel section beyond transition fitting is below ground and it is protected against corrosion by minimum 400 micron thick 2 pack high build epoxy coating			
14	Verify whether above ground service piping is galvanized iron or copper or carbon steel protected by anti-corrosive coating			
15	Verify whether welded risers are used wherever the service line riser is installed in confined spaces like basements.			
16	Verify whether the gap between riser and wall is minimum 25 mm and is supported at every 2 m			
17	Verify whether ventilators are provided in confined space			
18	Verify whether the PNGRB (Gas Supplies to Multi Occupancy Residential Buildings) Guidelines, 2020 and the PNGRB (Gas Supplies to Industrial, Commercial Customers) Guidelines, 2020. as applicable is adhered to wherever natural ventilation is not available			
19	Verify whether sleeve for laying steel pipe through wall, or under outer wall foundations of building or under the building is not used and it is protected against corrosion by minimum 400 micron thick 2 pack high build epoxy coating			
20	Verify whether plastic pipe above ground is not used. In case any section of plastic pipe extends above ground, verify whether it is completely encased in a concrete casing			
21	Verify whether plastic service lines under or inside the			

Sr. no.	Parameters	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	building is not installed			
22	Verify whether piping connecting consumer meter set assembly to consumer gas appliance is either GI or copper up to last valve located near actual appliance			
23	Verify whether appliance is connected to gas line with a flexible and braided hose as per IS 9573.			
25	Verify whether the hose does not expose to internal or external temperature exceeding the recommended limits			
26	Verify whether the length of the hose is not more than 1.5 meters and both ends of the hose is firmly clamped on the nozzle by metallic clamps			
27	Verify whether the location of customer's meter and regulator installation are made safe manner.			
28	Verify if meter is installed outside the premises then protection by steel fencing is provided			
Schedule -1E				
29	Verify that the O&M procedure are developed and followed.			
Schedule -1F				
30	Verify whether above ground pipeline is protected from corrosion.			

NOTES: Refer Schedule 1D of CGD technical standard

Minimum 10 nos. houses to be checked, on random basis across the network for the verification of aboveground installations.

(x) CNG DISPENSING STATION

Sr. No.	Items	Details / Observation	Recommendations	Criticality level (HH/H/M/L)
1	Location of CNG Station			
2	Type of CNG Station			
3	Compression Capacity (Total)			
4	Verify whether the valid PESO license is in place for all CNG stations.			
NATURAL GAS QUALITY & ODOURISATION				
5	Verify whether Quality of Compressed Natural Gas (CNG) for automotive purposes is governed by IS:15958.			
6	Verify Whether the odour is strong enough to detect its presence down to a concentration of CNG in air not exceeding 20% of the lower limit of flammability.			
7	Verify whether the injection of odorizing agent is being done in sufficient quantity to ensure perception of CNG leakage in line with IS:15319.			
8	Verify whether the suitable type of filters is used for limiting liquid particulate in the CNG.			
9	verify whether the odorisation and filtration system is located in a separate working area from the compressor or CNG storage unit and clear safety distance of 1.5 M around the odorisation and filtration system is maintained, in case the natural gas is not odourised.			
10	Verify whether the odorisation pumping as and filtration system have 100% stand-by capacity			
FACILITY PLANNING				
11	Verify whether the CNG refueling system is comprise of a gas compression apparatus, static or mobile cascade or pressure vessel and a gas dispenser incorporating a measuring device.			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
12	Verify whether the systems and components of CNG facility(ies) is certified for CNG use and marked accordingly by applicable statutory authority or the agency authorized by such authority.			
13	Verify whether inter-distances between various equipment, storage cylinders or cascade and like other device is as per Table-I & Table-2 of this schedule.			
14	Verify whether Safety distances not indicated in table-1 & table-2 is as approved by Petroleum and Explosives Safety Organisation on case to case basis after due consideration of all influencing factors.			
15	Verify whether the CNG storage and dispensing facilities inside a MS or HSD Service Station is located in an isolated area not interfering in the vehicular movement on the drive way and not coming within the hazardous areas of petroleum facilities as prescribed in the Fourth schedule of the Petroleum Rules, 2002.			
16	Verify whether the CNG facilities is not located beneath bare electric power lines or where exposed by their failure.			
17	In case CNG Compressors or Storage units installed on the top of the RCC canopy then verify whether its validation is done by a qualified engineer			
18	In case the compressor is installed on the top of the canopy then verify the cascades are not placed above such compressor and it should comply with the points (i) to (xiii) of clause 4.2.5.			
19	Verify whether provisions related to convenience store or ATM or office cabin is regulated as per point (a) to (e) of clause 4.2.6.			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
20	If Multiple cascades are located maintaining inter-distance of minimum 1 m, then, verify whether the required safety distances are considered of the water capacity of the higher capacity individual cascade.			
21	Verify whether a suitable curbing platform is provided at the base of the dispensing unit to prevent vehicles from coming too near the unit.			
22	Verify whether installations meets 4 Hr Fire rating in line with IS 1642:1989-Code of practice for fire safety of buildings, If on the side towards the boundary of the installation, the clearance as specified in the Table-2 is not available			
23	Whether the buried pipe come out of the ground, the wrapping coating is continued for a length of at least 300 mm above ground			
24	Whether the vent routed to a safe area and in a manner that gas vented out is blown away from the nearest building and the height of the vent is minimum 3 meters above the working level			
CNG STORAGE SYSTEM (STATIC)				
24	Verify whether the cascade having horizontal cylinders and sited parallel to other cascade or cylinder fittings is arranged such that they do not face cylinder fittings of other cascade.			
25	Verify whether cylinder installed horizontally in a cascade is separated from another cylinder in the cascade by a distance of minimum 20 mm.			
26	Verify whether cascade with horizontal cylinders have the valves fitted on the same side within the cascade opposite to the refueling point and arranged in a manner that any gas leakage is discharged upwards.			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
27	Verify whether cascade or bulk units are installed on a firm, compacted, well-drained non-combustible foundation and such foundation may be in the form of a plinth with the raised edge at 2 M from the front and sides of the cascade forming a kerb up to which vehicles are permitted and the cascade is securely anchored to prevent floating in case flooding is anticipated.			
28	Verify whether gas storage facility is protected from the effects of the weather by a roof or canopy designed to facilitate the dispersion of free or escaped gas.			
29	Verify whether adequate means are provided to prevent the flow or accumulation of flammable or combustible liquids under containers such as by grading, pads or diversion curbs.			
30	Verify whether the static CNG storage system comply with the following provisions:			
31	a) The frame structural members must be designed for a vertical load of 2 times the maximum gross weight of the bundle and the design stress levels shall not exceed is as per IS 800;			
	b) The frame must not contain any protrusions from the exterior frame structure that could cause a hazardous condition;			
	c) The frame design must prevent collection of water or other debris that would increase the tare weight of bundles filled by weight;			
	d) The cylinders shall be manufactured as per IS 7285-1, IS 7285-2, ISO 11119-1, ISO 11119-2, ISO 11119-3, ISO 11120, EN 12245, EN 12247;			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	e) Individual cascade shall have all cylinders of a particular make, type and capacity and all cylinders in a cascade shall conform to a single design code (mentioned above in para (d));			
32	Verify whether cascade storage on the top of the roof is permitted on first floor and there is no any further construction or inhabitation above this storage.			
CNG STORAGE SYSTEM (Mobile):				
33	Verify whether the dedicated trailer, truck or any other vehicle are used for transportation of CNG storage units and such units have lugs fitted for lifting and in no case magnetic device are used for lifting purposes.			
34	Verify whether the vehicle with the cascade thereon, are placed with easy access and egress on a low platform or hard compacted ground, which are extend to atleast another one meter on all sides and this platform or hard ground are under a light roof or canopy as described in point 27 above.			
35	Verify whether the trailers or vehicle carrying CNG are made immovable by application of brake and wheel choke prior to initiation of filling or dispensing operation.			
36	Verify whether attached to a trailer or mounted on a vehicle chassis frame the cascade are designed to meet the requirements of point (i) to (xiv) of clause 6.5.			
CYLINDERS:				
37	Verify whether the cylinders and their fittings for CNG use are designed, manufactured, tested including hydrostatic stretch test at a pressure in full conformity to IS 7285-1, IS 7285-2, ISO 11119-1, ISO 11119-2, ISO 11119-3, ISO 11120, EN 12245, EN 12247 or other national or international standards having approval from statutory			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	authority under Gas Cylinder Rules, 2004 i.e. Petroleum and Explosives Safety Organisation considering the maximum allowable operating pressure of 250 bar.			
38	Verify whether cylinders are permanently and clearly marked for “CNG only” and also labelled "CNG ONLY" in letter at least 25 mm high in contrasting colour in a location which is visible after installation.			
39	Verify whether the cylinders are re-examined or re-tested every three years and in accordance with Gas Cylinder Rules, 2004 by a competent person in line with the directives of the Petroleum and Explosives Safety Organisation with due markings and no cylinder is used which has not been duly re-tested			
40	Verify whether cylinders are painted white to reduce solar heating effect and protect it from atmospheric corrosion.			
CNG PIPING OR TUBING:				
41	Verify whether all rigid piping, tubing, fittings and other piping components are confirm to the recommendations of ANSI B 31.3 and all the elements of piping are designed for the full range of pressures, temperatures and loading.			
42	Verify whether gaskets, packing and any other materials used are compatible with natural gas and its service conditions.			
43	Verify whether all the piping and tubing have minimum turns with adequate provision for expansion, contraction, jarring, vibration and settling and the exterior piping may be either buried with suitable corrosion protection or installed 30 cm. above the ground level with supports and protection against mechanical and corrosive damage.			
44	Verify whether rigid pipelines have welded joints between their respective components.			

45	Verify whether all the piping and tubing withstand a pressure equal to			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	that of safety relief device and tested accordingly after assembly and the testing is done by inert gas and in case natural gas is used the suitable safety measures are adhered to.			
46	Verify whether the fuel lines have a positive segregation with electrical cables.			
VALVES:				
47	Verify whether minimum of four shut off valves are fitted between the gas storage unit and vehicle refueling filling nozzle as explained in points (a) to (d) of clause 8.7			
48	Verify whether all valves mentioned in above point and other elements of piping are suitable for the full range of pressure and temperature have permanent marking for service rating and like other markings.			
CNG HOSES:				
49	Verify whether internally braided, electrically continuous, non-metallic and metallic hoses resistant to corrosion and suitable to the natural gas service are used for CNG service in the downstream of emergency and isolation shut off valve.			
50	Verify whether the flexible hoses and their connections are suitable for most severe pressure and temperature service condition expected with a burst pressure of at least four times the maximum working pressure.			

51	Verify whether the flexible hoses with their connections are be tested after assembly and prior to use to at least two times the working pressure and also tested to a pneumatic pressure of at least 400 bar under water and thereafter, all the hoses are examined visually and tested for leaks with soapsuds or equivalent at an interval not exceeding one year and hoses are rejected and destroyed in the event of any leakage and such tests are recorded and such records are available at installations at all times and such tests, examinations, rejections and destruction is done safely in a controlled environment			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	by the trained technicians having adequate expertise with respect to the assembly of hoses, breakaways, valves and fuel nozzles.			
52	Verify whether flexible hoses have permanent marking indicating the manufacturer's name or identification, working pressure and suitability for use with CNG.			
53	Verify whether CNG flexible electrically conductive hose is meeting the requirement as per NFPA-52 or NGV 4.2 or equivalent.			
PRESSURE GAUGES:				
54	Verify whether every CNG storage unit including each cascade or bulk storage tank is provided with a suitable pressure gauge directly in communication with them.			
55	Verify whether the CNG storage unit have an opening not to exceed 1.4-mm diameter at the connection where pressure gauge is mounted.			
56	Verify whether the pressure gauge have dial graduated to read approximately double the operating pressure but in no case less than 1.2 times the pressure at which pressure relief valve is set to function.			
57	Verify whether all pressure gauges in the installation are tested and calibrated atleast once a year and records maintained.			
COMPRESSOR STATION:				
58	Verify whether the piping and its fittings upto the battery limit of CNG installation conforms to ASME B 31.8 or equivalent			
59	Verify whether compressor are designed for use in CNG service and for the pressures and temperature to which it may be subjected under normal operating conditions conforming to API 618/ API 813 / API 11 P or equivalent standard and flame proof electric motor and associated fittings conforms to IS/IEC 60079 suitable for Gas Group IIA as applicable for Natural Gas.			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
60	Verify whether compressor is fitted with the requirements stated in points (a) to (g) of clause 11.3			
61	Verify whether the compressor is provided with clear and permanent markings readily accessible and easy to read in the installed position as per the points (a) to (j) in clause 11.4			
62	Verify whether the compressor and it's all fittings is tested for compliance of relevant standard suitable for CNG use by a qualified engineer.			
PRESSURE RELIEF DEVICE:				
63	Verify whether safety relief devices confirm to the requirements of API 520 or equivalent equipment design standards.			
64	Verify whether safety relief devices are installed with unobstructed full size discharge to a safe place on bulk tanks and cylinders in the vertical position with suitable rain caps and such devices have their outlet arranged in a manner so that in case of emergency a high-pressure gas escapes from the devices does not directly hit on operators or persons in the close vicinity.			
65	Verify whether the cylinder have safety relief devices fitted in conformity to the Gas Cylinder Rules; 2004.			
66	Verify whether piping is protected by safety relief devices in conformity to design standards.			
67	Verify whether safety relief valves have a locking arrangement to prevent tampering by unauthorized persons and any adjustments to the safety relief valves is made by manufacturer or a competent person and such valves have a permanent tag indicating pressure setting, date of re-setting or setting and capacity.			
68	Verify whether all safety relief devices are tested at least once a year for proper operations and records are maintained.			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
69	Verify whether all the safety relief devices have manufacturer's permanent marking indicating the following; namely: - (a) Set pressure to start discharge; and (b) Discharge capacity in CuM / min.			
70	Verify whether no shut off valves is installed between the safety relief device and the gas storage unit or bulk tank.			
71	Verify whether all natural gas devices not otherwise specifically mentioned are constructed and installed to provide a safety equivalent to that other parts of the system.			
72	Verify whether the gas detectors interlocked with compressor cut out switch in the electrical system of the compressor are installed which would automatically switch off the unit in case of major gas leak.			
73	Verify whether the colour (yellow or black) coding used for fitting (valves , pressure reducing device).			
ELECTRICAL EQUIPMENT				
73	Verify whether all electrical wiring and equipment, gas storage dispensing unit located in hazardous area Division I and II are in accordance with the law in force relating to electricity, Gas Cylinder Rules,2004 and IS:5571, IS:5572, NFPA - 52.			
74	Verify whether the earthing at the installation, protection against ignition arising out of static, lightning and stray currents are as per the law in force relating to electricity.			
75	Verify whether electrical power distribution system is as per paragraph 4.0 of Schedule 1			

76	Verify whether a suitable LT power distribution panel (PDP) is designed, to feed the various types of loads safely in downstream distribution on the LT side, from a centralized location.			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
SAFETY AT VEHICLE FOR REFUELING				
77	Verify whether the vehicles have approved type of CNG kit fitted in accordance with the guidelines of Government of India, Ministry of Surface Transport, and authorised in a workshop conducted for such purpose and such workshop issue a fitness certificate to the vehicle for its suitability for CNG use and such certificate is always carried by the driver of the vehicle at all times.			
78	Verify whether driver of the vehicle carries the record showing the last examination of the vital parts of the system fitted in the vehicle for CNG use and their next due date for such examination and such record includes the test periodicity of cylinder, pressure relief devices, pressure gauges, piping and other like requirements.			
79	Verify whether the cylinder with valves and connected facilities fitted in the vehicle are in accordance with Gas Cylinder Rules,2004 and such cylinder are subjected to hydraulic test at least once every three years.			
80	Verify whether every vehicle using CNG fuel system displays “CNG” labels prominently in compliance to the law in force relating to motor vehicle.			
81	Verify whether manufacturing of Type-1 and Type 2 Nozzles are in accordance with NGV1 and ISO 14469-2 standards.			
DISPENSING UNIT:				
82	Verify whether dispensers are installed on a suitable foundation observing the minimum safety distances and like other precautions. as given in paragraph 4.2 and the dispensing unit to be protected against possible damage by vehicular movement and the dispenser mounting and installation is in accordance with NFPA 52 and NFPA30A or as per design standard.			

83	Verify whether the flexible hoses fitted on the dispenser are			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	mechanically and electrically continuous and the design, material and construction of hoses suitable for CNG and withstand not less than four times the maximum working pressure of the system.			
84	Verify whether the dispensing unit is of a type approved by the Petroleum and Explosives Safety Organisation or concerned Statutory Authorities.			
85	Verify whether dispensing unit is suitable for use of CNG in accordance with NGV 4.1 and hoses as per NGV 4.2 and breakaway as per NGV 4.4.			
CNG REFUELING INTO VEHICLES:				
86	Verify whether the vehicle refueling is done by an experienced operator duly certified by the oil or gas company having control over the refueling station.			
87	Verify whether the operator of the CNG dispensing unit checks the following prior to refueling the gas:			
	(a) The driver of the vehicle is carrying updated history record as specified in paragraph 14;			
	(b) There is no smoking, naked flame or any other source of ignition within six meters of the refueling point';			
	(c) There is no leakage in the CNG fuel system reported by the driver of the vehicle;			
	(d) The fuel connection is in good condition and matches the dispensers filling nozzle and the fuel connection shall be tight without any leakage;			
	(e) The engine is switched off, hand brake is firmly applied, the vehicle parked in gear or in "P" with automatic transmission; and			
	(f) No passenger including crew remain inside the vehicle.			
88	Verify whether procedure of refueling displayed near the dispensing			

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	unit and the same is strictly followed by the operator.			
89	Verify whether the cylinder on the vehicle is not charged in excess of maximum allowable working pressure at normal temperature for the cylinder.			
90	Verify whether the operator and driver ensure that there are no apparent gas leaks either on the vehicle or on the dispensing point before the refueled vehicle is driven away from the dispensing point.			
91	Verify whether the warning signs depicting "STOP VEHICLE", "NO SMOKING", "NO OPEN FLAME PERMITTED", "FLAMMABLE GAS", "NO MOBILE PHONE", "SWITCH OFF THE MOBILE PHONES" are displayed on suitable places at the dispensing station and compressor areas and the location of the signs are such that they are prominently visible from each point of the transfer or operation.			
92	Verify whether the operator take all measures for ensuring smooth vehicle movement in the outlet including restriction on number of vehicles near the fill points.			
FIRE PROTECTION:				
93	Verify whether the fire fighting facilities is carefully planned after considering the availability of municipal fire tenders and other related matters and, the portable fire extinguishers are positioned as per the table given in Clause 17.1.			
94	Verify whether any other flammable materials not specified in this standard in the CNG installation is stored in a non-flammable chamber with a minimum safety distance of 15 M from compressor station or MCC or electrical installation, as the case maybe.			

95	Verify whether all approaches to machines, compressors, storage facilities and work places are free from obstacles, so that they are readily accessible in an emergency.			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
96	Verify whether the electrical installations are inspected by an Electrical Inspector as per IE Rules in force and compliance is made as pointed out in the inspection and the records are maintained for all periodic inspections.			
97	Verify whether the flameproof characteristics of electrical equipment is checked through visual checks, condition of gasket, completeness and tightness of bolts, glands and as recommended by manufacturer's test Certificates.			
98	Verify whether the unauthorized additions or modifications of the service station whether temporary or permanent, which are nor permissible or authorized under the law or the standards in practice, are taken up.			
99	Verify whether the proper illumination is ensured for all operating and non-operating areas.			
100	Verify whether all electrical maintenance at the Automotive Station is undertaken by electrical technician licensed under law in force and under the supervision of authorised person in this behalf.			
101	Verify whether each installation have minimum two numbers hand held explosive meter in working conditions at all times.			
102	Verify whether the work permit is issued by designated person and is followed and the Annexure – vi (A) and vi (B) in Schedule 1 are followed.			
EMERGENCY PLAN AND PROCEDURE				
103	Verify whether a comprehensive ERDMP is developed in accordance to the PNGRB (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP)) Regulations, 2010 and copies of the ERDMP is available to all personnel at the CNG dispensing station.			

104	Verify whether the entity having control over the refueling station			
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Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
	draw an operational emergency plan in consultation with adjoining establishments and local authorities e.g. fire brigade, police, and other District Emergency Authorities and like other Authorities. for the circumstances mentioned in clause 18.2			
105	Verify whether the emergency plan specified in paragraph 18.2 is disseminated amongst all personnel involved to ensure that they understand their roles and responsibilities in the event of an emergency.			
106	Verify whether the operator of the refueling station have close liaison with Fire Service, the Police, the Municipal Authorities and the person supplying gas to CNG facility.			
107	Verify whether important telephone numbers for emergency use are displayed prominently.			
108	Verify whether means of communication is always at the disposal of the In charge of the installation on 24 hours basis.			
109	Verify whether the emergency plan is tested with drill at least once a year.			
COMPETENCE ASSURANCE AND ASSESSMENT:				
110	Verify whether entity has developed, implemented, and maintained a written training plan to instruct all CNG dispensing station personnel with respect to the matters specified in paragraphs 19.2.1 to 19.3.			
111	Verify whether proper records for the training and refresher courses are maintained at the installation.			
AUTOMATION:				
112	Verify whether the automation (Forecourt Control) where provided, has complied with the provisions as specified paragraph 5.0 of Schedule 1.			
SAFETY INSPECTIONS OR AUDIT:				

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
113	Verify whether the safety inspections or audit of CNG dispensing station is carried out as per the table given in Clause 21.0			
OTHER:				
114	Check whether the Central CNG office is in place for attending complaints.			
115	Verify that resistance of earth pit is monitoring in defined frequency and Grid resistance value is not exceeded 01 ohm as per IS 3043			
116	Verify whether driver of CNG vehicle has valid driving license, Hazardous good transport training certificate and vehicle has spark arrestor or exemption certificate of PESO for that type of vehicle			
117	Verify whether the station is in compliance with pollution control boards (hazardous waste disposal, dB levels)			
118	Verify whether the record of the practice like carrying out periodic work place inspection of all critical activities by senior management team is available.			
119	Whether the limits of operating parameters (pressure, temperature, flow, levels etc.) are indicated			

Note- 1. Separate Checklist to be filled for every inspected CNG Station.

For more details, the PNGRB (Dispensing of Automotive Fuels) Regulations, 2018 may be referred.

(xi) IMPORTANT SAFETY CHECKS

Sr. No.	Items	Details / Observations	Recommendations	Criticality level (HH/H/M/L)
1	Verify whether the Quantitative Risk assessment is carried out for the installations within the city limits for the area having steel pipe wall less than 6.4 mm.			
2	Verify whether the pressure control facilities are provided with Over pressure shut-off valve.			
3	Verify whether the necessary safety precautions are taken during testing and commissioning.			
4	Verify whether the Safe Control of Operation process is in place and records are maintained.			
5	Verify whether the calibration record of meters, gauges and other instrument are available.			
6	Verify whether the GIS based asset management system is in place and database is updated			
7	Verify whether Mock Drill is being conducted, what is frequency as required twice a year (sch. 1 E)			
8	Verify whether Designated Liaison Officer is nominated by entity for Liaisoning with other authorities Name			
9	Verify whether Safety Audits of internal and external activities are being done at defined interval			
10	Verify whether observations/ Non conformities of safety audits are complied			

(xii) Typical Mock Drill Reporting Format

1.	Date and Time of Mock Drill			
2.	Location			
3.	Details of Emergency Scenario			
4.	Details of initiation/activation of emergency			
5.	Description of the Mock drill (the narrative of the situation, all actions) including response of emergency team and mitigation actions			
6.	Communication and Response of Emergency teams			
	Events	Expected Response time	Actual Response time	Remarks, if any
a)	Siren activation after initiation			
b)	Reporting of CIC			
c)	Reporting of SIC			
d)	Fire team			
e)	Medical team			
f)	Security Team			
g)	Mutual Aid			
h)	E&M			
i)	others			
7.	Head Count			
a)	Total persons present in the installation before the drill	Employees: Contractual: Others:		
b)	Total persons available at Assembly point(s)			
c)	Difference of head count after drill			

d)	Action taken to search the shortfall of head counts, if any	
8.	Time of 'All Clear'	
9.	Duration of Mock Drill (in Minutes)	

10.	Observations (including highlight the positives of the drill)	
11.	Recommendations	
12.	Emergency Exercise Observers	
	Name of the observer	Area of Observation

(xiii) OTHER OBSERVATIONS / RECOMMENDATIONS

Sr. No.	Details / Observations	Recommendations
1		
2		
3		
4		
5		