



गेल (इंडिया) लिमिटेड

(भारत सरकार का उपक्रम – महारत्न कंपनी)

GAIL (India) Limited

(A Government of India Undertaking - A Maharatna Company)

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No.: GAIL/ND/RA/T4S-REFGPU-REG/2020/

Date: 30.04.2020

To
The Secretary,
Petroleum and Natural Gas Regulatory Board,
1st Floor, World Trade Centre, Babar Road,
New Delhi – 110001.

Respected Madam,

Subject: Views/Comments on Draft PNGRB T4S Regulations for Refineries and Gas Processing Plants.

This has reference to the PNGRB Public Notice dated 17.02.2020 inviting views/comments on the Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020.

2. In this regard, the views/comments of GAIL are enclosed as **Annexure-A**.

Submitted please.

Yours Sincerely,

S. Kumar

(Kumar Shanker)

Chief General Manager (Mktg-RA)

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Encl: As Above

Draft Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020.

Clause	Description	GAIL Comments	Justifications
2 (1) (f)	<p>“Control of Work” process means a documented system to control hazardous work. It covers job planning, risk assessment, scheduling, isolation management and a formal PTW (Permit to Work) system.</p> <p>a. “Cold Work” means an activity which does not produce sufficient heat to ignite a flammable air - hydrocarbon mixture or a flammable substance.</p> <p>b. “Permit” means a formal and detailed agreed document that contains location, time, equipment to be worked on, hazard identification, mitigation / precaution measure(s) used and the names of those authorizing the work and performing the work.</p> <p>c. “Hot Work” means an activity that can produce a spark or flame or other source of ignition having sufficient energy to cause ignition, where the potential for flammable vapors, gases, or dust exists.</p> <p>d. “Approver” means designated Plant/ Area in-charge is to approve an activity based on the risk involved in executing the activity. Higher the risk, higher would be the approval level required for authorization.</p> <p>e. “Issuer” means designated person authorized to issue work permit.</p> <p>f. “Receiver” means designated person authorized to receive work permit.</p>	<p>Sub Clauses may be re-arranged to provide sequencing on subject matter as follows:</p> <p>a. Permit b. Cold Work c. Hot Work d. Issuer e. Receiver</p> <p>‘Approver’ may be further reviewed, as ‘Approver’ word has not been mentioned anywhere in detailed specifications.</p>	<p>OISD 105 does not mention any “Approver”.</p>
2 (1) (z)	<p>“Impounding area” means an area that may be defined through the use of dykes or the topography at the site</p>	<p>May be removed.</p>	<p>Given definition addresses the</p>

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Clause	Description	GAIL Comments	Justifications
	for the purpose of containing any accidental spill of LNG or flammable refrigerants;		requirement of LNG only and subject definition nowhere mentioned in detailed Specifications & Standards.
2 (1) (ff) & (jj)	“Petroleum Refinery” and “Refinery”:	It appears that “Petroleum Refinery” and “Refinery are two different categories as per definition. This needs to be reviewed as the facilities mentioned under ‘Refinery’ are also part of “Petroleum refinery”.	--
2 (1) (ss)at 150 C;	May be clearly mentioned as 15 ^o C for better understanding.	--
6.	Technical standards and specifications including safety standards (hereinafter referred to as standards) for Refineries and Gas Processing Plants shall be as specified in Schedule - 1 which cover design and layout, electrical systems, process system, maintenance, inspection, competency assessment, fire prevention, leak detection, firefighting system and safety management system.	As there are many Schedules in this Regulations the “Schedule - 1” may be replaced with “Schedules”.	Typographical error.
7 (4)	If an entity has laid, built, constructed, under construction or expanded the Refineries and Gas Processing Plants based on some other standard or is not meeting the requirements specified in these regulations, the entity shall carry out a detailed Quantitative Risk Analysis (RA; HAZOP & HAZID) of its infrastructure. The entity shall thereafter take approval	May be further reviewed as: The entity shall thereafter take approval from its concerned Director appointed by the Entity’s Board for nonconformities and mitigation measures. The	Sub-regulation 7 (2) stipulates that The Board of the entity shall appoint one of its directors, within ninety days of these regulations coming into

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Clause	Description	GAIL Comments	Justifications
	from its Board for nonconformities and mitigation measures. The entity's Board approval along with the compliance report, mitigation measures and implementation schedule shall be submitted to the Board within six months from the date of notification of these regulations.	appointed director's approval along with the compliance report, mitigation measures and implementation schedule shall be submitted to the Board within six months from the date of notification of these regulations in line with 7 (2).	force, to be responsible for ensuring compliance to these regulations.
Sch 1 1.1.(ii)	The hydrocarbon industry over the years learnt lessons from fires, explosions, toxic releases etc. throughout the world and has been up-dating plant safety norms including inter-distances between facilities and their relative locations. The minimum distances recommended many years ago need review in the context of today's environment in the industry.	Last sentence i.e "The minimum distances recommended many years ago need review in the context of today's environment in the industry" may be reviewed for its meaning in context.	If required inter distances may be reviewed separately.
Sch 1 1.2 (o)	Location of emergency control center and alternate control center shall be identified and should be close to OHC, Fire control room and Security control center.	Minor typographical error. May be replaced as 'should be closed'. Location of alternate control centre should be far away from emergency control centre so that it can be effectively used during non-functional of main emergency control centre.	--
Sch 1 1.3.1.(r)	Smoking shall not be permitted in inside the installation.	This is a physical measure, need to be addressed in some other Clause.	This Clause and Sub Clauses mainly stipulates the requirement w.r.t layout of blocks and facilities.

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Clause	Description	GAIL Comments	Justifications
Sch 1 1.4.1 (e)	Vessels having large liquid hold-up should be installed at lower heights and preferably at grade. Adequate drainage should be provided around such vessels. Where process requirement dictates their installation above grade, these should be located in open area.	Capacity of vessel should be defined for clarity w.r.t large liquid hold-up.	--
Sch 1 1.4.1.(h)	Vessels, column, Reactors with internals and / or containing catalysts, chemicals etc should have a drop-out area for removing / installing the internals and / or for loading / unloading of catalysts and chemicals.	Also “demarked hard area for crane movement” may be included.	--
Sch 1 1.6	1.6 Layout of LPG Facilities 1.6.1 General Considerations 1.6.1.1 LPG Storage 1.6.1.2 LPG bottling facility	In place of mentioning partial stipulations under this head, reference of PNGRB (Technical Standards and Specifications including Safety Standards for T4S for LPG Storage, Handling and Bottling Facilities) Regulations, 2019 may be mentioned for uniformity. In case of any additional stipulations, same needs to be incorporated in existing standards.	Stipulations under Schedule 1.6 on LPG facilities are partially taken from PNGRB (Technical Standards and Specifications including Safety Standards for T4S for LPG Storage, Handling and Bottling Facilities) Regulations, 2019.
Sch 2 2.1.1.2	No hydrocarbon and other toxic releases shall be discharged to atmosphere directly. However, in certain situation like marketing installations, LPG bottling plants and other remotely located installations where hydrocarbons are stored and handled and no flare or other closed disposal systems are feasible, the relieved vapours can be discharged to atmosphere. In such	Para may be defied as: No hydrocarbon and other toxic releases shall be discharged to atmosphere directly. However, in certain situation like marketing installations, LPG bottling plants and other locations where	It is not feasible for some of process facilities to connect with flare to discharge hydrocarbon(e.g. Atmospheric storages cannot be connected to

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Clause	Description	GAIL Comments	Justifications
	<p>case following key points shall be considered while routing PSV discharge to atmosphere:</p>	<p>hydrocarbons are stored and handled and no flare or other closed disposal systems are feasible, the relieved vapours can be discharged to atmosphere. In such case following key points shall be considered while routing PSV discharge to atmosphere:</p>	<p>the flare system).</p>
<p>Sch 2 2.1.3.4</p>	<p>Guidelines for Compressor Design and Manufacture: should we go into such details? The equipment are designed referring to API standards, why should we repeat he requirements and make the document bulky?</p>	<p>Typographical error, may be deleted.</p>	<p>--</p>
<p>Sch 2 2.1.4.2</p>	<p>Steam Purity</p>	<p>May be added after Steam Purity: "A typical steam limits are given below:"</p>	<p>--</p>
<p>Sch 2 2.2.2</p>	<p>2.2.2 Liquefied Petroleum Gas Mounded Storage Facility 2.2.2.1 – 2.2.2.13</p>	<p>In place of mentioning partial stipulations under this head, reference of PNGRB (Technical Standards and Specifications including Safety Standards for T4S for LPG Storage, Handling and Bottling Facilities) Regulations, 2019 may be mentioned for uniformity.</p>	<p>Stipulations under Schedule 2.2.2 on Liquefied Petroleum Gas Mounded Storage are partially taken from PNGRB (Technical Standards and Specifications including Safety Standards for T4S for LPG Storage, Handling and Bottling Facilities) Regulations, 2019.</p>

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Clause	Description	GAIL Comments	Justifications
Sch 2 2.2.1.4 (ii)	Vacuum release valves shall be provided with chain lever arrangement for release in case of stuck up vacuum release valves.	Applicability of this clause may further be reviewed.	--
Sch 2 2.2.2.9	Fittings and Instruments on A Vessel	This Point is written for Mounded storage only. Applicability of same is not mentioned for LPG Spheres/others. May be reviewed.	--
Sch 2 2.2.2.10 (1)(ii)(a)	Fire Detection / Protection System: An audio visual alarm at the local/ main control panel and fire water station, indicating the fire.	Requirement of audio visual alarm at fire water station may be reviewed. It should be at Fire Station.	--
Sch 3 3.1	Mechanical Completion of the Refinery projects 1. Installation of piping and equipment	Installation of piping and equipment also be witnessed by PMC.	--
Sch 3 3.5.1 (iii)	Water having quality which meets the Company's approval shall be used for hydrostatic test purpose. In systems where residual moisture can't be tolerated, e.g., in SO ₂ , acid, ammonia and LPG service, and where certain catalysts are used, oil is the preferred test medium. If the water has to be used, the system should afterwards be dried out with hot air. Special attention should be given to the points where water may be trapped, such as in valve bodies or low points.	Water quality may be defined to meet the hydro testing requirements.	--
Sch 3 3.5	Pressure Testing of Equipment/ piping Hydrostatic Testing of Instrument lines / connections: 1) Certain types of instruments with their connecting process lead pipelines shall be tested at the same pressure as the main pipelines or the equipment to	Also may include "(f) Thermowells installed in process pipelines for temperature elements" in this category	--

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Clause	Description	GAIL Comments	Justifications
	which they are connected. Such instruments normally include the following types: (a) Displacer type level instruments, (b) Gauge glasses, (c) Rotameters, (d) Control valves (e) Flow meter pots.		
Sch 3 3.5.6 condition to P7ID	Typographical error condition to P&ID	--
Sch 5 5.1.x	There shall be classified for the degree extent of hazard from flammable materials. Classification of hazardous areas for all areas shall be done as per guidelines indicated in latest IS 5572 and equipment selection for hazardous area shall be as per IS 16724/IEC 60079-14. All electrical equipment in hazardous area shall be minimum suitable for Zone-2 Gas Group IIA/IIB, Temperature class T3.	Last sentence of para "All electrical equipment in hazardous area shall be minimum suitable for Zone-2 Gas Group IIA/IIB, Temperature class T3" may be reviewed as it is conflicting with 5.7.1 of these regulations.	--
Sch 5 5.6.1.g	Luminaires, receptacles, exhaust fan etc. in Battery Room shall be Ex-d, IIC, T3 Type of protection.	Point may be reviewed in keeping the view of latest type of maintenance free batteries are used and cluster of batteries for provision of requisite protection.	For VRAL and SMF batteries, such requirement may be exempted, as many small telecom batteries are kept in AC room itself, where installation of exhaust fan is very difficult.
Sch 5 5.8.3.e	All transformers with oil capacity more than 2000 litres \shall be provided with firefighting as per IS/IE rules or with nitrogen injection fire protection system.	May be modified as below: All transformers of 10 MVA and above rating or in case of oil filled transformers with oil capacity of	CEA rules on firefighting facilities for transformers are under review by the Regulator.

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Clause	Description	GAIL Comments	Justifications
		more than 2000 litres are provided with firefighting system in accordance with latest CEA rules.	
Sch 5 5.8.11.	Earthing System	May also include: "All equipment handling 250 V or more shall be provided with double earthing & to be connected to two different earth pits"	In accordance with other PNGRB Regulations.
Sch 5 5.8.12	Instrument earthing Separate earth bars above ground shall be provided for Instrument earthing	Further reference for earthing /grounding of control systems may be given from IEEE STD 1100-1992 " IEEE Recommended practice for powering and grounding sensitive electronic equipment"	--
Sch 5 5.9.1 (vii)	Critical lighting (DC supply based) will be normally kept 'ON' and during Normal/emergency power failure, battery will provide power.	May be further clarified for better understanding.	--
Sch 5 5.9.4.2 (xi)	Cable straight through joints in power and control cables shall be avoided as far as possible inside unit battery limits. Cables shall be in one length where practical but cable joints may be installed when necessary. Above ground cable joints shall not be installed in hazardous areas.	Para may be modified as: Cable straight through joints in power and control cables shall be avoided as far as possible inside unit battery limits. Underground or above ground Cables shall be in one length where practical but cable joints may be installed when necessary.	It has not been defined as in which area cable joints are allowed when necessary. It is not possible to avoid cable joints above ground in the hazardous area, what shall be the

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Clause	Description	GAIL Comments	Justifications
			procedure/ precaution to be taken for having cable joints in hazardous area?
Sch 7 7.2.7 & 7.11	7.2.7 Clean agent based automatic fire detection and extinguishing system shall be provided for all control rooms and satellite rack rooms (SRR). Selection of Clean Agent and design of Fire protection system for process control rooms and SRR shall follow the Standard on “Clean Agent Extinguishing systems NFPA Standard 2001 (latest edition) including its safety guidelines with respect to “Hazards to Personnel”, electrical clearance and environmental factors in line with environmental considerations of Kyoto & Montreal Protocols and latest MoEF regulations.	Clean agent based automatic fire detection and extinguishing system shall be provided for all control rooms and satellite rack rooms (SRR). Selection of Clean Agent and design of Fire protection system for process control rooms and SRR shall follow applicable NFPA Standards including its safety guidelines with respect to “Hazards to Personnel”, electrical clearance and environmental factors in line with environmental considerations of Kyoto & Montreal Protocols and latest MoEF regulations.	Clean Agent Extinguishing Systems NFPA Standard 2001 (latest edition) only specifies the alternative to halons. USA EPA SNAP provides comprehensive lists of Clean Agents for the purpose of Fire Extinguishing Agents.
Sch 7 7.3.3	The fire water network shall be kept pressurised at minimum 7.0 kg/cm ² g at all the time	The fire water network shall be kept pressurised at minimum 7.0 kg/cm ² g at all the time and & remote location pressure may be displayed in fire water pump house / fire control room.	To adopt more focused approach.
Sch 7 7.3.4.2	Suitable provisions shall be kept for makeup firewater during firefighting time. Provision should be made to divert water from various sources like ETP, Process	Word ‘ETP’ may be replaced ‘ETP (after treatment)’ for better understanding.	--

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Clause	Description	GAIL Comments	Justifications
	Cooling Water, river, ponds etc. to the fire water system.		
Sch 7 7.4.4	The fire water network shall be kept pressurised at minimum 7.0 kg/cm ² g by jockey pumps. Minimum 2 Jockey pumps (1 working plus 1 standby) shall be provided. The capacity of the pump shall be sufficient to maintain system pressure in the event of leakages from valves etc. Its head shall be higher than the main fire water pumps. Auto cut-in / cut-off facility should be provided for jockey pumps.	Capacity of Jockey Pump may be defined for clarity during installation.	--
Sch 7 7.5.3	Protection for underground pipelines	Cathodic Protection may also be included for fire water line.	--
Sch 7 7.17.1.2	Following areas shall be provided with Smoke/ Flame / Heat detectors with alarm and/or system to actuate relevant fire suppression system:	Following areas shall be provided with LEL/ Flame / Heat detectors with alarm and/or system to actuate relevant Water Spray System:	--
Sch 7 7.18.(iv)	Fire Siren Code	May be replaced with Siren Code and aligned with ERDMP Regulations for uniformity.	--
Sch 7 7.19.9	Fire sirens should be tested at least once a week. Testing of Manual call points once in a month.	Testing of Manual call points once in three month.	--
Sch 7 7.20	A mock fire drill should be conducted once in a month to rehearse the fire emergency procedure and to keep the fire fighting team trained and alert and facilities in top order.	A mock fire drill should be conducted once in three months to rehearse the fire emergency procedure and to keep the fire fighting team trained and alert and facilities in top order.	Taking reference of PNGRB (ERDMP) Regulations, 2010
Sch 7	Functional Operability of Detectors:	The clause may be changed as	Now a days intelligent

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Clause	Description	GAIL Comments	Justifications
7.23.3	The operability of all type of detectors should be tested once in three months.	“The operability of all type of detectors should be tested at least quarterly or in line with OEM recommendations”.	type detection system are being installed, which do not require testing for operability periodically.
Sch 8	Competence Assessment and Assurance	Safety Management System under Schedule 13 may be moved above the Schedule: 8 Competence Assessment & Assurance, Schedule-9: Safety Audits, Schedule-10: Road Safety Schedule-11: Occupational Health and Industrial Hygiene Monitoring & Schedule-12: Control of Work	Safety Management System encompasses of elements like Leadership & Commitment, Work Permit, PHA, Occupation Health, Compliance Audit etc. Theoretically and practically Schedule 8, 9, 10, 11 & 12 are the integral part of Safety Management System.
Sch 9 9.2.1	Types of Safety Audits: Two types of Safety Audits are proposed to be carried out as below: (i) Internal Safety Audit:	May be revised as: Two types of Safety Audits are proposed to be carried out as below: (i) Internal Safety Audit (ii) Technical & Safety Audit	To align with sub-regulation 8 (1)
Sch 12 12.3.1. (ii)	Controlling risk by applying controls in the following hierarchy of controls: (a) Elimination	‘(d) Isolation’ may be removed.	Only five hierarchy of controls i.e Elimination, Substitution,

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Clause	Description	GAIL Comments	Justifications
	(b) Substitution (c) Engineering (d) Isolation (e) Administrative (f) Personal protective equipment.		Engineering, Administrative & PPEs has been defined by OSHA & other institutions.
Sch 12 12.4.2	Type of Work Permits Based on the nature of work to be performed, the following minimum type of work permits shall be used. (a) Cold Work (b) Hot Work (c) Confined Space Entry (d) Electrical isolation and Energization (e) Work at height (f) Critical lifts (To be defined) (g) Composite permit as applicable (h) Radiography (i) Excavation	(f) 'Critical lifts (To be defined)' may be removed	This permit category has not been defined in OISD STD 105.
Sch 12 12.4.4 & 12.4.8	Lessons Learned:	Both the Sub Clauses addressing the lesson learned to be further reviewed for duplicity.	--
Sch 13 3 (xi)	A comprehensive Emergency Response and Disaster Management Plan (ERDMP) shall be developed in accordance to the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP)) Regulations, 2010. The copies of the ERDMP shall be maintained at each petroleum installation. The emergency response planning shall have clear written	May be modified as: A comprehensive Emergency Response and Disaster Management Plan (ERDMP) shall be developed in accordance to the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency	ERDMP Regulations detailed out comprehensive stipulations w.r.t emergency planning, mitigation, preparedness, response, recovery etc. Hence,

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Clause	Description	GAIL Comments	Justifications
	procedures for expected actions during anticipated emergencies. Emergency response plan shall include operational and procedural requirements for various emergency scenarios that are relevant for the installation.....	Response and Disaster Management Plan (ERDMP) Regulations, 2010.	additional requirements may not be required to detail out in the regulations.
Sch 13 3 (xiii)	Compliance Audit- The entity shall perform audits to examine its conformity with this regulation and the implementation of its SMS.	Para may be modified as: The entity shall perform audits to examine its conformity with this regulation and the implementation of its SMS in accordance with PNGRB (Third Party Conformity Assessment) Regulations, 2015	To align with the PNGRB Regulations on Internal/T4S Audits.
Sch 13 3 (xiv)	The entity shall conduct a comprehensive internal audit at least once every year.....	May be considered as a Sub Clause of 3 (xiii)	-
Sch 13 3 (xv)	External audit shall be performed by external professionals.....	May be considered as a Sub Clause of 3 (xiii) External Audit may be replaced with Technical & Safety Audit.	To align with Clause 8 (1)
Sch 13 3 (xvi)	The audit program and procedures should cover:	May be considered as a Sub Clause of 3 (xiii)	--
Table 1	SEPARATION DISTANCES BETWEEN BLOCKS/FACILITIES	Inter distances between Electrical Sub Station to other facilities also may be provided.	--