



NATIONAL ACCREDITATION BOARD FOR CERTIFICATION BODIES (NABCB)

Quality Council of India (QCI), 2nd Floor, Institution of Engineers Building, Bahadur Shah Zafar Marg, New Delhi – 110002
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Competence requirements for Inspection Bodies for Accreditation under PNGRB Regulations

BCB 501(O&G)-February 2021



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Contents

1.0 Foreword	3
2.0 Scope	3
3.0 Sub Sector Classification w.r.t. PNGRB Regulation	3
4.0 Competence Requirements for Inspection bodies accredited as per requirements of PNGRB Regulation	6
5.0 Team Composition	10
6.0 Documentation for Competence	10
7.0 Amendment Record	11



1.0 Foreword

The National Accreditation Board for Certification Bodies (NABCB) provides accreditation to inspection bodies in accordance with ISO/IEC 17020 standard. The Inspection Bodies (IB) provide inspection services to industry sectors including Oil & Gas sector, which is crucial to economy and involves high risk of hazards in the installation / operation of oil & gas facilities. This document specifies additional requirements that shall be complied by the applicant / accredited inspection bodies to ensure appropriate competence for providing inspection services to the industry in oil & gas sector as well as for the regulatory / statutory bodies to rely on inspection services provided by the NABCB accredited inspection bodies for specific scope of accreditation in the oil & gas sector.

Petroleum and Natural Gas Regulatory Board (PNGRB) is the regulatory board constituted by the Government of India to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to promote competitive markets and for matters connected therewith or incidental thereto.

As a part of the responsibility, the PNGRB has also formulated regulations on Technical Standards and Specifications including Safety Standards (T4S) in short in areas of City Gas Distribution network (CGD), Natural Gas Pipelines and Petroleum & Petroleum Products Pipelines, LNG Facilities, Integrity Management System (IMS) for CGD & NG Pipelines and Emergency Response & Disaster Management Plan (ERDMP) in mid and downstream sector. The enforcement of these regulations is monitored directly by the Board or by utilizing the services of accredited inspection bodies.

A MoU between PNGRB and QCI, of which NABCB is a constituent Board, also exists in this regard. NABCB shall review the requirements for accredited Inspection Bodies in line with regulatory mandate of PNGRB.

2.0 Scope

This document specifies the competence requirements to be followed by inspection bodies under NABCB accreditation. The Scope Sector category with respect to PNGRB Regulations for Natural Gas Pipelines, CGD Networks, Petroleum Product Pipelines, LNG and LPG Facilities is also listed in the document to support the Inspection Bodies in classification.

3.0 PNGRB Regulations Sub Sector Classification in Oil & Gas Sector:

The table below describes the sub sectors in Petroleum and Natural Gas category.

PNGRB REGULATION/NOTIFICATION		APPLICABLE TO SUB- SECTOR CATEGORY
1	Codes of Practices for Emergency Response And Disaster Management Plan (ERDMP) Regulations -2010	(a) Hydrocarbons processing installation (Refinery, Gas processing, LNG Re-gasification installations etc.); (b) Pipeline such as Natural Gas, Propane, Butane etc. and the hydrocarbons products which remain



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		<p>in gaseous state at NTP;</p> <p>(c) Liquid Petroleum Product pipeline;</p> <p>(d) Commercial petroleum storage facilities, gas storage facilities and terminals including LNG terminals;</p> <p>(e) Hydrocarbons gas bottling Installations having receiving, storage and handling facilities including storage for LPG, Propane and Butane;</p> <p>(f) City or local Natural Gas Distribution facilities;</p> <p>(g) Dispensing stations and POL retail outlets;</p> <p>(h) Transportation of Petroleum products by road;</p> <p>(i) Any other installation as may be notified by the Board from time to time;</p>
2	Technical Standards and Specifications including Safety Standards for Natural Gas Pipelines Regulations, 2009	Natural Gas Pipelines including dedicated pipelines.
3	Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks Regulations , 2008	City or local Gas Distribution Network
4	Petroleum and Natural Gas Regulatory Board (Integrity Management System for Natural gas pipelines) Regulations, 2012.	Natural Gas Pipelines including dedicated pipelines.
5	Petroleum and Natural Gas Regulatory Board (Integrity Management System for CGD) Regulations, 2012.	City or local Gas Distribution Network
6.	Petroleum and Natural Gas Regulatory Board (Petroleum and Petroleum Products Pipelines) Regulations 2016	Petroleum and Petroleum product pipelines including dedicated pipelines.
7.	Technical Standards and Specifications including Safety Standards for Liquefied Natural Gas Facilities Regulations-2018	Liquefied Natural Gas (LNG) Facilities

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8.	Technical Standards and Specifications including Safety Standards for Retail Outlets dispensing Petroleum, Auto LPG and CNG Regulations-2018	Retail Outlets for Petroleum , Auto LPG, CNG, LCNG, LNG Dispensing
9.	Technical Standards and Specifications including Safety Standards for LPG Storage, Handling and Bottling Facilities Regulations-2019	LPG Storage, Handling and Bottling facilities
10.	Third Party Conformity Assessment Regulations-2015	TPIA of Oil & Gas installations/facilities mid and downstream
11	Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Petroleum Installations) Regulations, 2020	Petroleum installations
12.	Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020	Regulation under preparation
13	Petroleum and Natural Gas Regulatory Board (Integrity Management System for Petroleum and Petroleum Products Pipelines) Regulations 2020	Regulation under preparation



4.0 Competence Requirements for Inspection Bodies accredited as per requirements of PNGRB Regulation.

Applicable PNGRB Regulations:

- i) T4S for Natural Gas Pipelines-2009
- ii) T4S for City Gas Distribution Network-2008
- iii) T4S for Petroleum & Petroleum Products pipelines-2016
- iv) T4S for Liquefied Natural Gas Facilities-2018
- v) T4S for Liquefied Petroleum Gas Storage, Handling and Bottling Facilities Regulations-2019
- vii) IMS for Natural Gas Pipelines- 2012
- viii) IMS for City Gas Distribution Network-2012
- ix) Emergency Response and Disaster Management Plan (ERDMP) for Midstream and Downstream installations -2010

Competencies for T4S & IMS auditing and ERDMP verification as per PNGRB Regulations:

S.No.	STREAM Of ENGINEERING/ SCIENCE	EDUCATION & EXPERIENCE DETAIL	
1.	Mechanical / Metallurgy /Materials/Production	Qualification & Experience B.E. / B. Tech/ AMIE or equivalent in: Mechanical /Metallurgical Engineering from recognized institution and having work experience of minimum 5 years in Oil & Gas Sector post qualification.	Experience requirements Essential: Awareness: a) PNGRB Regulations and PNGRB circulated checklists for T4S & IMS audits. b) Statutory OISD Standards c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc. d) Awareness of Risk Assessment/ Analysis/QRA e) Applicable national / international codes such as API, ASME, NACE, NFPA etc. f) Knowledge of IB documentation of technical procedures, Checklists, Formats etc. g) Knowledge of Operation & Maintenance Additionally , at least one of the following:



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			<p>a) Non Destructive Testing (NDT) Level –II ISNT /ASNT in Ultrasonic /Radiography / Magnetic Particle Testing, Thickness Survey</p> <p>b) Experience in Procurement /Inspection/ Audits/Acceptance /Laying/ testing of on-shore/off shore pipeline Cathodic Protection / Wrapping /Coating practices & associated Testing</p> <p>c) Preventive/Predictive Maintenance of Rotary & Static Mechanical equipment.</p> <p>d) Safety Audits</p> <p>e) Computer proficiency, Communication & Report writing skills</p>
2.	CIVIL / STRUCTURAL ENGINEERING	<p>B.E. / B.Tech/ AMIE or equivalent in:</p> <p>Civil Engineering from a recognized institution and having work experience of minimum 5 years in Oil & Gas Sector post qualification.</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for T4S & IMS audits</p> <p>b) Statutory OISD standards.</p> <p>c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.</p> <p>d) Applicable national / international codes such as API, ASME, NACE, NFPA etc.</p> <p>e) Risk Assessment/ Analysis/QRA</p> <p>f) Pipeline stress analysis / Structural integrity</p> <p>g) Geographical Information System (GIS)</p> <p>h) Knowledge of IB documentation of technical procedures, Checklists, Formats etc.</p> <p>i) Knowledge of Operation & Maintenance</p> <p>Additionally, at least one of the following:</p> <p>a) Design/Construction/Cathodic Protection /Wrapping/Coating practices.</p> <p>b) Procurement /Inspection /Acceptance / testing of pipeline /operation / safety</p> <p>c) Safety Audits</p> <p>e) Computer proficiency, Communication & Report writing skills</p>
3.	ELECTRICAL/ CONTROL /INSTRUMENTATION	<p>B.E. / B.Tech/ AMIE or equivalent in:</p> <p>Electrical/ Electronics/ Instrumentation & Control Engineering</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for T4S and IMS audits</p>



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		<p>from a recognized institution and having work experience of minimum 5 years in Oil & Gas Sector post qualification</p>	<p>b) Statutory OISD standards, BIS Standards on Electrical Earthing, Area Classification and Selection of Electrical Equipment</p> <p>c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.</p> <p>d) Awareness of Risk Assessment/ Analysis / QRA</p> <p>e) Applicable national / international codes such as API, ASME, NACE, NFPA etc.</p> <p>f) Knowledge of IB documentation of technical procedures, Checklists, Formats etc.</p> <p>g) Electrical Maintenance of HT & LT Rotary and Static Equipment, Sub-station equipment and facilities</p> <p>h) Inspection/Testing of electrical equipment</p> <p>i) Cathodic Protection /Coating/Wrapping</p> <p>j) Selection of equipment /instrument for hazardous zones, specific maintenance / testing requirements.</p> <p>k) Instrument / Control equipment Maintenance / /Inspection /Testing, UPS/DCS maintenance/ Inspection/testing, Logics, Interlocks, Communication equipment, operation/safety.</p> <p>l) Operation & Maintenance</p> <p>Additionally, at least one of the following:</p> <p>a) Safety Audits</p> <p>b) Computer proficiency, Communication & Report writing skills</p>
4.	<p>CHEMICAL/PETROLEUM /PETROCHEMICAL/PROCESS Engineer</p>	<p>B.E/ B.Tech. / AMIE/ in: Chemical/ Petroleum / Petrochemical Engineering from a recognized institution and having work experience of minimum 5 years for Engineering in Oil & Gas Sector post qualification</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for T4S and IMS audits</p> <p>b) Statutory OISD standards, BIS Standards on Area Classification and Selection of Electrical Equipment</p> <p>c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.</p> <p>d) Awareness of Risk Assessment/ Analysis /QRA</p> <p>e) Applicable national / international codes such as API, ASME, NACE, NFPA etc.</p>



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			<p>f) Knowledge of IB documentation of technical procedures, Checklists, Formats etc.</p> <p>g) Chemical Hazards/HAZID/HAZOP/Risk Assessment</p> <p>h) Procurement/Inspection/Acceptance/laying/ & associated Testing/operation/safety.</p> <p>i) Operation & Maintenance</p> <p>Additionally, at least one of the following:</p> <p>a) Safety Audits</p> <p>b) Computer proficiency, Communication & Report writing skills</p>
5.	Health, Safety and Environment	B.E./B. Tech. /AMIE with Diploma in Industrial Safety/ Degree in Fire Engineering from a recognized institution and having work experience of minimum 5 years in Oil & Gas Sector post qualification	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for T4S & IMS audits and ERDMP of installations as per Regulation-2010</p> <p>b) Statutory OISD standards, BIS Standards on Area Classification and Selection of Electrical Equipment</p> <p>c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.</p> <p>d)Applicable national / international codes such as API, ASME, NACE, NFPA etc.</p> <p>e) Risk Assessment/ Analysis/QRA/HAZID</p> <p>f) HSE in operation / maintenance / testing / construction /commissioning/de-commissioning etc.</p> <p>g) Operation & Maintenance</p> <p>Additionally, atleast one of the following:</p> <p>a) Safety Audits</p> <p>b)Computer proficiency, Communication & Report writing skills</p>



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5.0 TEAM COMPOSITION:

Following Teams (minimum Nos. of auditors/inspectors) with required competencies (see Item No. 4) are required for Audits and Verification of PNGRB Regulations by TPIA:

T4S Audits in (Nos.)				IMS Audits in (Nos.)		ERDMP Verification of (Nos.)					
CGD	NGPL /PPPL	LPG Plants & Storage	LNG Facilities	CGD	NGPL	Refinery	GPU	Cross Country P/L	CGD	LPG & LNG Facilities	POL/ AFS
3	3	2/ 3 **	3	3	3	4 *	3*	3 *	3*	3*	3*/2*

NOTES:

- * Inclusion of HSE member in ERDMP Verification Audit Team is mandatory for verification of ERDMP Regulation.
- ** 2 Nos. of personnel in audit team up to 100 MT of LPG Storage & Handling and 3 Nos. above 100 MT recommended.
- Inclusion of Process Engineering member in Audit Team is mandatory for verification of Process plants (Refinery, GPU, LPG Recovery units etc.).
- For any audit/inspection, the inspection team shall have **relevant experience of product / facility to be audited** in following fields:
 - Audits
 - Safety
 - O&M
 - Inspection
 - Preventive/Predictive Maintenance
 - Atleast two members of the inspection team shall have relevant experience in operation & maintenance of the facilities being audited.

6.0 Documentation for Competence:

Inspection Bodies would be required to maintain records of knowledge and competence evaluation of its personnel on annual basis. This shall be applicable even if the teams are regularly carrying out Inspection/Audit work. Attrition of competent personnel and action taken/being taken shall be informed to NABCB every six months.



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7.0 Amendment Record

<u>Date</u>	<u>Auth. By</u>	<u>Description of Amendment</u>
20.08.2020	NABCB TC	Inclusion of Competencies needed for carrying out T4S audit as per LPG, LNG Regulations of PNGRB
09.10.2020	NABCB TC	Inclusion of comments of TC members
09.02.2021	NABCB TC	Inclusion of comments by PNGRB