



## **NATIONAL ACCREDITATION BOARD FOR CERTIFICATION BODIES (NABCB)**

Quality Council of India (QCI), 2<sup>nd</sup> Floor, Institution of Engineers Building, Bahadur Shah Zafar Marg, New Delhi – 110002  
Phone: +91-11-2337 8056 / 57; Fax: +91-11-2337 8678; E-mail: nabcb@qcin.org; Web: www.qcin.org;

### **Competence requirements for Inspection Bodies for accreditation against PNGRB Regulations**

**BCB 501(O&G)–September, 2018**



Effective Date: 15 October, 2018



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### 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 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 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 Specifications and Standards including Safety Standards or T4S in short, in areas of City gas distribution network (CGD), Natural Gas Trunk pipelines and Petroleum & Petroleum Products Pipelines, Integrity Management System or IMS for CGD & NG Pipelines, Emergency Response & Disaster Management Plan (ERDMP) etc. The enforcement of these regulations is monitored directly by 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 related requirements to be followed by inspection bodies under NABCB accreditation. The scope sector category of petroleum and natural gas is also listed in the document to support the inspection bodies in classification.

### 3.0 Sub Sector Classification in O & G 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 in gaseous state at NTP; (c) liquid petroleum product pipeline; (d) commercial petroleum storage facilities, gas storage facilities and

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		<p>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	All existing and new natural gas pipelines including dedicated pipelines.
3	Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks Regulations , 2008	All existing and new city or local gas distribution network
4	Petroleum and Natural Gas Regulatory Board (Integrity Management System for Natural gas pipelines) Regulations, 2012.	All existing and new natural gas pipelines including dedicated pipelines.
5	Petroleum and Natural Gas Regulatory Board (Integrity Management System for CGD) Regulations, 2012.	All existing and new city or local gas distribution network
6.	Petroleum and Natural Gas Regulatory Board (Petroleum and Petroleum Products Pipelines) Regulations 2016	All existing and new petroleum and petroleum product pipelines including dedicated pipelines.
7.	Technical Standards and Specifications including Safety Standards for Liquefied Natural Gas Facilities	All existing and new Liquefied Natural Gas Facilities

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8.	Technical Standards and Specifications including Safety Standards for Retail Outlets dispensing Petroleum, Auto LPG and CNG	Regulation under preparation
9.	Technical Standards and Specifications including Safety Standards for LPG Storage, Handling and Bottling Facilities	Regulation under preparation
10.	Technical Standards and Specifications including Safety Standards for Petroleum Installations	Regulation under preparation
11.	Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants	Regulation under preparation



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**4.0 Competence Requirements for Inspection bodies accredited as per requirements of PNGRB regulation.**

Competence matrix for PNGRB Regulations/Notifications is enlisted in table below

S.No.	STREAM OF ENGINEERING/ SCIENCE	EDUCATION & EXPERIENCE DETAIL	
		Qualification & Experience	Experience requirements
1.	Mechanical / Metallurgy (Inspection) /Materials/Production  Applicable PNGRB Regulations: i)T4S for NG Pipelines ii) T4S for CGD Network iii) T4S for Petroleum & Petroleum Products pipelines iv) IMS for NG Pipelines v) IMS for CGD Network vi) T4S for Liquid NG Facilities vii)ERDMP	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.	Essential:  Awareness of: a) PNGRB Regulations and PNGRB circulated checklists for audits b) OISD, BIS 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.  Additionally, atleast one of the following: a) Non Destructive Testing (NDT) Level –II ISNT /ASNT in Ultrasonic /Radiography / Magnetic Particle Testing, Thickness Survey b)Experience in Procurement /Inspection/ Audits/Acceptance /Laying/ testing of on-shore/off shore pipeline Cathodic Protection / Wrapping /Coating practices & associated Testing c)Preventive/Predictive Maintenance of Rotary & Static Mechanical equipment. d)Safety Audits e) Operation & Maintenance f)Computer proficiency, Communication & Report writing skills
2.	CIVIL / STRUCTURAL ENGINEERING  Applicable PNGRB Regulations:	B.E. / B.Tech/ AMIE or equivalent in:  Civil Engineering from a recognized	Essential:  Awareness of:



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	<p>i) T-4S Audit for NG Pipelines</p> <p>ii) T-4S Audit for CGD Network</p> <p>iii) T-4S Audit for Petroleum &amp; Petroleum Products pipelines</p> <p>iv) IMS for NG Pipelines</p> <p>v) IMS for CGD Network</p> <p>vi) T4S for Liquid NG Facilities</p> <p>vii)ERDMP</p>	<p>institution and having work experience of minimum 5 years in Oil &amp; Gas Sector post qualification.</p>	<p>a)PNGRB Regulations and PNGRB circulated checklists for audits</p> <p>b) OISD, BIS 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>Additionally, atleast 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>d) Operation &amp; Maintenance</p> <p>e) Computer proficiency, Communication &amp; Report writing skills</p>
<p>3.</p>	<p><b>ELECTRICAL/ CONTROL /INSTRUMENTATION</b></p> <p>Applicable PNGRB Regulations:</p> <p>i)T-4S Audit for NG Pipelines</p> <p>ii) T-4S Audit for CGD Network</p> <p>iii) T-4S Audit for Petroleum &amp; Petroleum Products pipelines</p> <p>iv) IMS for NG Pipelines</p> <p>v) IMS for CGD Network</p> <p>vi) T4S for Liquid NG Facilities</p> <p>vii)ERDMP</p>	<p>B.E. / B.Tech/ AMIE or equivalent in:</p> <p>Electrical/ Electronics/ Instrumentation &amp; Control Engineering from a recognized institution and having work experience of minimum 5 years in Oil &amp; Gas Sector post qualification</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a)PNGRB Regulations and PNGRB circulated checklists for audits</p> <p>b) OISD, BIS Standards</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 &amp; LT Rotary and Static Equipment, Sub-station equipment and facilities</p> <p>h)Inspection/Testing of electrical equipment</p>



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			<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>Additionally, atleast one of the following:</p> <p>a)Safety Audits</p> <p>b)Operation &amp; Maintenance</p> <p>c)Computer proficiency, Communication &amp; Report writing skills</p>
4.	<p>CHEMICAL/PETROLEUM /PETROCHEMICAL/PROCESS Engineer</p> <p>Applicable PNGRB Regulations:</p> <p>i)T-4S Audit for NG Pipelines</p> <p>ii) T-4S Audit for CGD Network</p> <p>iii) T-4S Audit for Petroleum &amp; Petroleum Products pipelines</p> <p>iv) IMS for NG Pipelines</p> <p>v) IMS for CGD Network</p> <p>vi) T4S for Liquid NG Facilities</p> <p>vii)ERDMP</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 &amp; Gas Sector post qualification</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for audits</p> <p>b) OISD, BIS Standards</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) Chemical Hazards/HAZID/HAZOP/Risk Assessment</p> <p>h) Procurement/Inspection/Acceptance/laying/ &amp; associated Testing/operation/safety.</p> <p>Additionally, atleast one of the following:</p> <p>a)Safety Audits</p> <p>b)Operation &amp; Maintenance</p> <p>c)Computer proficiency, Communication &amp; Report writing skills</p>
5.	<p>Health, Safety and Environment</p> <p>Consideration for HSE personnel in ERDMP Audit Team is</p>	<p>B.E./B. Tech. /AMIE/Diploma in Industrial Safety/ Degree in Fire Engineering from a recognized institution</p>	<p>Essential:</p> <p>Awareness of:</p> <p>a) PNGRB Regulations and PNGRB circulated checklists for audits</p>





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	mandatory for installations mentioned in ERDMP Regulation	and having work experience of minimum 5 years in Oil & Gas Sector post qualification	b) OISD, BIS Standards c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc. d) Applicable national / international codes such as API, ASME, NACE, NFPA etc. e) Risk Assessment/ Analysis/QRA f) HSE in operation / maintenance / testing / construction / commissioning/de-commissioning etc. Additionally, atleast one of the following: a) Safety Audits b) Operation & Maintenance c) Computer proficiency, Communication & Report writing skills
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### 5.0 TEAM COMPOSITION:

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

T-4S Audits in		IMS Audits in		ERDMP Verification of						
CGD	NGPL /PPPL	CGD	NGPL /PPPL	Refinery	Gas Processing	Cross Country P/L	CGD	LPG & LNG Plants	POL	Others
3 Nos.	3 Nos.	3 Nos.	3 Nos.	4 Nos.	3 Nos.	3 Nos.	3 Nos.	3 Nos.	3 Nos.	3 Nos.

For any audit/inspection, the inspection team shall have relevant experience in all spheres related to Scope of Work:

- Audits
- Safety
- O&M
- Inspection
- Preventive/Predictive Maintenance

### 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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### Amendment Record

Date

Auth. By

Description of Amendment