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.

<table>
<thead>
<tr>
<th>PNGRB REGULATION/NOTIFICATION</th>
<th>APPLICABLE TO SUB-SECTOR CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Codes of Practices for Emergency Response And Disaster Management Plan (ERDMP) Regulations -2010</td>
<td>(a) hydrocarbons processing installation (refinery, gas processing, LNG Regasification 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</td>
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<tr>
<td></td>
<td>Technical Standards and Specifications including Safety Standards for Natural Gas Pipelines Regulations, 2009</td>
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<tr>
<td>2</td>
<td>Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks Regulations, 2008</td>
</tr>
<tr>
<td>3</td>
<td>Petroleum and Natural Gas Regulatory Board (Integrity Management System for Natural gas pipelines) Regulations, 2012.</td>
</tr>
<tr>
<td>4</td>
<td>Petroleum and Natural Gas Regulatory Board (Integrity Management System for CGD) Regulations, 2012.</td>
</tr>
<tr>
<td>5</td>
<td>Petroleum and Natural Gas Regulatory Board (Petroleum and Petroleum Products Pipelines) Regulations 2016</td>
</tr>
<tr>
<td>6.</td>
<td>Technical Standards and Specifications including Safety Standards for Liquefied Natural Gas Facilities</td>
</tr>
</tbody>
</table>

Terminals including LNG terminals;
(e) hydrocarbons gas bottling installations having receiving, storage and handling facilities including storage for LPG, propane and butane;
(f) city or local natural gas distribution facilities;
(g) dispensing stations and POL retail outlets;
(h) transportation of petroleum products by road;
(i) any other installation as may be notified by the Board from time to time;
<table>
<thead>
<tr>
<th></th>
<th>Technical Standards and Specifications including Safety Standards</th>
<th>Regulation under preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Technical Standards and Specifications including Safety Standards for Retail Outlets dispensing Petroleum, Auto LPG and CNG</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Technical Standards and Specifications including Safety Standards for LPG Storage, Handling and Bottling Facilities</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Technical Standards and Specifications including Safety Standards for Petroleum Installations</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>STREAM OF ENGINEERING/ SCIENCE</th>
<th>QUALIFICATION &amp; EXPERIENCE DETAIL</th>
<th>EXPERIENCE REQUIREMENTS</th>
</tr>
</thead>
</table>
| 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 institution | Essential:  
   Awareness of:  
   a) Knowledge of Civil Engineering principles and practices  
   b) Structural Analysis and Design  
   c) Construction Management and Supervision  
   d) Knowledge of statutory requirements under Building Codes etc.  
   e) Computer proficiency, Communication & Report writing skills |
### Competence Requirements for Inspection Bodies for accreditation against PNGRB Regulations

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#### 1. INSPECTION

| i) T-4S Audit for NG Pipelines | Institution and having work experience of minimum 5 years in Oil & Gas Sector post qualification. | a) PNGRB Regulations and PNGRB circulated checklists for audits |
| ii) T-4S Audit for CGD Network | | b) OISD, BIS Standards |
| iii) T-4S Audit for Petroleum & Petroleum Products pipelines | | c) Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc. |
| iv) IMS for NG Pipelines | | d) Applicable national / international codes such as API, ASME, NACE, NFPA etc. |
| v) IMS for CGD Network | | e) Risk Assessment/ Analysis/QRA |
| vi) T4S for Liquid NG Facilities | | f) Pipeline stress analysis / Structural integrity |
| vii) ERDMP | | g) Geographical Information System (GIS) |

#### 2. INSPECTORS

**i)** PNGRB Regulations and PNGRB circulated checklists for audits

**ii)** OISD, BIS Standards

**iii)** Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.

**iv)** Applicable national / international codes such as API, ASME, NACE, NFPA etc.

**v)** Knowledge of IB documentation of technical procedures, Checklists, Formats etc.

Additionally, at least one of the following:

**a)** Design/Construction/Cathodic Protection/ Wrapping/ Coating practices.

**b)** Procurement / Inspection / Acceptance / testing of pipeline / operation / safety

**c)** Safety Audits

**d)** Operation & Maintenance

**e)** Computer proficiency, Communication & Report writing skills

### 3. ELECTRICAL/ CONTROL / INSTRUMENTATION

<table>
<thead>
<tr>
<th>Applicable PNGRB Regulations:</th>
<th>B.E. / B.Tech/ AMIE or equivalent in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) T-4S Audit for NG Pipelines</td>
<td>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</td>
</tr>
<tr>
<td>ii) T-4S Audit for CGD Network</td>
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<tr>
<td>iii) T-4S Audit for Petroleum &amp; Petroleum Products pipelines</td>
<td></td>
</tr>
<tr>
<td>iv) IMS for NG Pipelines</td>
<td></td>
</tr>
<tr>
<td>v) IMS for CGD Network</td>
<td></td>
</tr>
<tr>
<td>vi) T4S for Liquid NG Facilities</td>
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<tr>
<td>vii) ERDMP</td>
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</tbody>
</table>

**Essential:**

**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.

**g)** Electrical Maintenance of HT & LT Rotary and Static Equipment, Sub-station equipment and facilities

**h)** Inspection/ Testing of electrical equipment
### CHEMICAL/PETROLEUM /PETROCHEMICAL/PROCESS Engineer

**Applicable PNGRB Regulations:**
1. T-4S Audit for NG Pipelines
2. T-4S Audit for CGD Network
3. T-4S Audit for Petroleum & Petroleum Products pipelines
4. IMS for NG Pipelines
5. IMS for CGD Network
6. T4S for Liquid NG Facilities
7. ERDMP

**Essential:**
- 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

**Essential:**
- Awareness of:
  1. PNGRB Regulations and PNGRB circulated checklists for audits
  2. OISD, BIS Standards
  3. Statutory requirements under Petroleum Rules/ Gas Cylinder Rules etc.
  4. Awareness of Risk Assessment/ Analysis /QRA
  5. Applicable national / international codes such as API, ASME, NACE, NFPA etc.
  6. Knowledge of IB documentation of technical procedures, Checklists, Formats etc.
  7. Chemical Hazards/HAZID/HAZOP/Risk Assessment

Additionally, atleast one of the following:
- Safety Audits
- Operation & Maintenance
- Computer proficiency, Communication & Report writing skills

### Health, Safety and Environment Consideration for HSE personnel in ERDMP Audit Team is

**Essential:**
- B.E./B. Tech. /AMIE/Diploma in Industrial Safety/ Degree in Fire Engineering from a recognized institution

**Essential:**
- Awareness of:
  1. PNGRB Regulations and PNGRB circulated checklists for audits
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, at least one of the following:

a) Safety Audits
b) Operation & Maintenance
c) Computer proficiency, Communication & Report writing skills

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:

<table>
<thead>
<tr>
<th>T-4S Audits in</th>
<th>IMS Audits in</th>
<th>ERDMP Verification of</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>CGD</td>
<td>NGPL / PPPL</td>
</tr>
<tr>
<td>3 Nos.</td>
<td>3 Nos.</td>
<td>3 Nos.</td>
</tr>
</tbody>
</table>

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.
## Amendment Record

<table>
<thead>
<tr>
<th>Date</th>
<th>Auth. By</th>
<th>Description of Amendment</th>
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