



ACCREDITATION SCHEME FOR INSPECTION BODIES

TECHNICAL NOTE: TA 01

SPECIFIC REQUIREMENTS FOR THE ACCREDITATION OF INSPECTION BODIES FOR THE TECHNICAL AUDIT OF EXTENSION SCHEMES FOR PRESSURE VESSELS

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1.0 INTRODUCTION

- 1.1 This technical document has been produced by the Singapore Accreditation Council (SAC) in conjunction with the Ministry of Manpower (MOM)'s Scheme for Extension of Statutory Inspection Period of Pressure Vessels (hereafter referred to as scheme).
- 1.2 This scheme as prescribed by the MOM is intended for an owner of a pressure vessel who wishes to have the examination of his pressure vessel extended beyond the statutory period prescribed under the Workplace Safety and Health (WSH) Act. The scheme is applicable to steam boilers, steam receivers or air receivers that are part of a continuous process plant or unit that are designed for extended run length cycle and that they cannot be taken out of service for examination without causing a consequential shutdown of the entire plant or unit.
- 1.3 Under the scheme, owners are required to establish and implement a suitable in-house written Scheme to Guarantee Safe Use (SGSU) of the pressure vessels to ensure the continual safe use of the pressure vessel during the extended period. The SGSU provides detailed process and frequency of any inspection or examination required to be carried out to affirm the continual safe use of the pressure vessels during the extended period.
- 1.4 This document provides guidance to those requirements in ISO/IEC 17020 *General criteria for the operation of various types of bodies performing assessment* which need interpretation when applied by Inspection Bodies carrying out technical audit of the scheme.
- 1.5 The term used in this document have been drawn from ISO/IEC 17020 or defined within this document. Where specific terms are drawn from other documents, such as from the WSH Act or other government legislation, reference is made to those documents.
- 1.6 The field of pressure vessels technical audit covers the assessment of various types of pressure vessels and their accessories. It includes pipes and fittings used in the process, storage and transmission of fluids and gases under pressure.

- 1.7 This technical note (TA 01) should be read in conjunction with documents listed in the Reference section and government regulations when applicable

2.0 OBJECTIVE AND PURPOSE

- 2.1 The purpose of technical audit is to determine the compliance and effectiveness of the implementation of the SGSU established by the owner of the pressure vessels. This is to ensure that the SGSU are in place and is effective and that there are no major non-compliances which may seriously undermine the integrity of the pressure vessels covered in the scheme. This will provide an independent assurance of the integrity of the pressure vessels and that the pressure vessels are being operated safely during the extended period.

3.0 SCOPE OF TECHNICAL AUDIT

- 3.1 The scope of accreditation for Inspection Body carrying out technical audit of SGSU as required under the scheme shall include but not limited to the following activities:
- (a) Reviewing all technical documentation describing the functions and processes of each pressure vessel and their relationships/links to demonstrate that the pressure vessels are part of a continuous process plant or unit designed for extended run length cycle and that they cannot be taken out of service for an inspection without causing a consequential shutdown of the entire plant or unit;
 - (b) Reviewing owner's pressure vessel management system (PVMS), SGSU, risk-based inspection (RBI) regime or pressure vessels inspection strategy developed in support of their applications for the scheme;
 - (c) Verifying that the owner of the pressure vessel has implemented a comprehensive SGSU to ensure the safe operation of the relevant pressure vessel covered under the scheme during the extended period;
 - (d) Reporting the result of the technical audit and to specify any remedial action and recommendations; and
 - (e) Commenting on the suitability of and any changes necessary to inspection methods/procedures/safe operating limits to ensure safe operation of the pressure vessel during the extended period.

- 3.2 The owner of the pressure vessel shall conduct a technical audit of the SGSU at least once every 24 months during the extension period. The technical audit shall ensure that all the requirements as detailed in the SGSU have been fully complied. In addition, the technical audit shall ensure that all non-compliances reported in the annual audit are rectified and closed, and any recommendations made are complied with without delay.
- 3.3 A copy of the technical audit report shall be submitted to the MOM and the Competent Person appointed by the owner of the pressure vessel under the scheme, promptly as soon as it becomes available
- 3.4 The owner shall develop an Action Plan arising from the technical audit with details on all the corrective action and recommendations to be made. The owner shall as far as is practicable, implement the recommendations made by the Inspection Body without undue delay. Any corrective action or recommendations not carried out must be highlighted and explained.
- 3.5 The technical auditors shall exercise due diligence when performing his duties in relation to the carrying out of the technical audit of the SGSU as required under the scheme.

4.0 PERSONNEL

- 4.1 The Inspection Body shall ensure that their technical auditors are medically fit for their scope of inspection.
- 4.2 The Inspection Body shall demonstrate that it has identified the competencies required to undertake the range of technical audit activities covered by its scope of accreditation and that it has processes in place to train, assess and monitor staff against those competencies.

4.3 The qualification criteria for the technical auditors are as follows:

	Category	Criteria
1	Academic Qualifications	<ul style="list-style-type: none"> • Degree or diploma in relevant engineering discipline from an institute of learning recognised by the relevant regulatory authority
2	Employment	<ul style="list-style-type: none"> • Employed by or under long term contract to the Inspection Body
3	Technical Experience	<ul style="list-style-type: none"> • At least 5 years experience in the field of steam boilers and pressure vessel systems, design, construction, inspection and other related technologies (Degree Holders) <p>Or</p> <p>At least 7 years experience in the field of steam boilers and pressure vessel systems, design, construction, inspection and other related technologies (Diploma Holders)</p>
4	Auditing Experience	<ul style="list-style-type: none"> • At least 3 years of experience in the field of auditing of management systems, technical systems or quality assurance activities (Degree Holders) <p>Or</p> <p>At least 5 years of experience in the field of auditing of management systems, technical systems or quality assurance activities (Diploma Holders)</p>
5	Training	<ul style="list-style-type: none"> • Attended and passed API 510 Pressure Vessel Inspector Certification examination or equivalent course conducted by an independent training provider. <p>And</p> <ul style="list-style-type: none"> • Attended an auditor course conducted by an independent training provider.

- 4.4 The Inspection Body shall have sufficient number of management personnel with suitable experience in the manufacture, inspection, operation or maintenance of pressure vessels, and have the technical knowledge to make professional judgments on the range of safety related problems likely to arise from the accredited scope of technical audit. Such personnel shall be knowledgeable in the:
- (a) Problems likely to arise from the declared processes or mechanical conditions;
 - (b) Risk-based inspection and pressure vessels inspection strategy;
 - (c) Likely damage or failure mechanism associated with various processes and fluids involved;
 - (d) Effects of operating conditions on the mechanical integrity of systems including interactions with upstream and downstream plant;
 - (e) Relevant regulatory requirements and associated codes of practice; and
 - (f) Inspection techniques associated with pressure vessels.
- 4.5 The Inspection Body must be familiar with the relevant standards or codes used in the accredited scope of technical audit as well as MOM's Scheme for Extension of Statutory Inspection Period of Pressure Vessels and the WSH Act.
- 4.6 The Inspection Body shall maintain records of technical auditors' qualifications, training and experience. The records shall include how and when each technical auditor is authorized by the Inspection Body to perform specific audit, inspection or examination.

5.0 TECHNICAL AUDIT METHODS AND PROCEDURES

- 5.1 The procedures used by the Inspection Body shall detail how the technical audit was conducted using the appropriate regulations, codes of practice, standards and guidance documents.
- 5.2 Where risk based inspection (RBI) techniques are used to establish the nature and frequency of inspections, the Inspection Body shall review the techniques used in the procedures.

- 5.3 Reporting requirements including statutory requirements for reporting non compliance shall be detailed in the procedures.
- 5.4 Codes, standards and other technical literature applicable to the construction, operation, inspection and repair of pressure vessels and their components within the accredited scope shall be maintained up to date and be readily available to the staff.

6.0 REFERENCES

This list is not exhaustive, but the relevant regulatory requirements, standards, specifications and codes pertinent to this document are listed below.

- a) ISO/IEC 17020:2012 – Conformity Assessment-Requirements for the operation of various types of bodies performing inspection
- b) ILAC P15:06/2012 – Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies
- c) Workplace Safety and Health Act (Chapter 354A):2009
- d) Workplace Safety and Health (General Provisions) Regulations 2011;
- e) Guidelines on Scheme for Extension of Statutory Examination Period of Pressure Vessels at Workplaces 2012 issued by MOM; and
- f) Technical Note: PV/LE 01 - Specific Requirements for the Accreditation of Inspection Bodies in Pressure Vessels and Lifting Equipment Inspection

Appendix 1

Inspection body: Type A

Type of Process	Type and Range of Inspection	Inspection Method, Codes or Standards Used
1) Scheme to Guarantee Safe Use (SGSU)	<ul style="list-style-type: none">a) Reviewing all technical documentation describing the functions and processes of each pressure vesselb) Reviewing owner's risk-based inspection regime or pressure vessels inspection strategyc) Verifying the effective implementation of schemed) Reporting the result of the technical audit and to specify any remedial action and recommendationse) Commenting on the suitability of and any changes necessary	

Approved signatories

Mr [Signatory A] - for item 1

Mr [Signatory B] - for item 1

NOTE :

Type A inspection body

The inspection body providing "third party" services.