



MINISTRY OF
MANPOWER

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES

Occupational Safety and Health Division, Ministry of Manpower
(Version 2024)

CONTENTS

1. INTRODUCTION	3
2. PRESSURE VESSELS	3
3. REGISTRATION OF NEW PRESSURE VESSELS.....	4
4. RE-REGISTRATION OF EXISTING PRESSURE VESSEL.....	5
5. DUTIES AND RESPONSIBILITIES OF OWNERS AND AUTHORISED EXAMINERS.....	5
6. RISK ASSESSMENT AND MANAGEMENT	8
APPENDIX 1 – GLOSSARY OF TERMS	10
APPENDIX 2 – DOCUMENTS TO BE SUBMITTED TO AUTHORISED EXAMINER AND RETAINED BY OWNER FOR REGISTRATION AND RE-REGISTRATION OF PRESSURE VESSEL.....	12
APPENDIX 3 – PROCESS FLOW FOR REGISTRATION OF NEW PRESSURE VESSEL / RE-REGISTRATION OF EXISTING PRESSURE VESSEL.....	13
APPENDIX 4 – LIST OF REQUIRED TESTS FOR REGISTRATION OF NEW PRESSURE VESSEL.....	14
APPENDIX 5 – LIST OF REQUIRED TESTS FOR RE-REGISTRATION OF EXISTING PRESSURE VESSEL..	15
APPENDIX 6 – ACCREDITED INSPECTION BODIES.....	16
APPENDIX 7 – SAMPLES OF ACCREDITATION DOCUMENTATION	18

1. INTRODUCTION

- 1.1 This **Guidelines for Registration of Pressure Vessels in Workplaces** is intended for owners of statutory pressure vessels who wish to have their pressure vessels approved for use in workplaces in Singapore.
- 1.2 Under the Workplace Safety and Health Act (“WSHA”), statutory pressure owners use in a workplace are required to obtain approval from the Commissioner for Workplace Safety and Health (“the Commissioner”) and ensure that examinations and tests specified by the Commissioner have been carried out by an Authorised Examiner (“AE”), before use in a workplace.
- 1.3 This document provides guidance to owners and AEs on the requirements for the use of statutory pressure vessels in workplaces, through a registration regime administered by the Occupational Safety and Health Division (“OSHD”) of the Ministry of Manpower (“MOM”).

2. PRESSURE VESSELS

- 2.1 A pressure vessel is a container or a vessel used for containing a substance under pressure, and includes a steam boiler, steam receiver, steam container, air receiver, refrigerating plant pressure receiver and gas cylinder.
- 2.2 If a pressure vessel fails while in use, it can cause fatal or serious body injuries to persons in the vicinity or severe damage to equipment and properties. It is therefore essential that the design, fabrication and use of pressure vessels are regulated to ensure that they are of good construction, sound material, free from patent defects and safe for intended use.
- 2.3 The types of statutory pressure vessels which require registration with MOM are:
 - (a) **Air Receiver** – any vessel containing air under pressure and connected with an air compressor, which includes compressor air tanks and headers, as well as any vessel which a liquid or solid substance is stored and forced by compressed air.

- (b) **Steam Boiler** – any closed vessel in which steam is generated at a pressure greater than atmospheric pressure, which includes autoclaves, steam generating heat exchangers, economisers and superheaters.
- (c) **Steam Receiver** – any vessel or apparatus (other than a steam boiler, steam container, steam pipe or coil or part of a prime mover) used for containing steam under pressure greater than atmospheric pressure.
- (d) **Refrigerating Plant Pressure Receiver** – any vessel containing refrigerant under pressure.

2.4 The following types of pressure vessels are not required to be registered with MOM:

- (a) Pressure vessels that operate under vacuum or negative pressure;
- (b) Air receivers, steam receivers or refrigerating plant pressure receivers where the safe working pressure does not exceed 0.5 bar, or the product of its safe working pressure and volume does not exceed 100 bar-litre; or
- (c) Steam boilers where the maximum permissible working pressure does not exceed 0.5 bar.

2.5 It shall be noted that although these pressure vessels do not require registration, they are required to comply with relevant requirements under the WSHA and its subsidiary legislation.

3. REGISTRATION OF NEW PRESSURE VESSELS

3.1 The owner¹ of a statutory pressure vessel who wishes to register their pressure vessel shall provide the required documents, as specified in Appendix 2, to the AE.

3.2 The registration process for a new pressure vessel is specified in Appendix 3.

3.3 Based on the documents provided, the AE shall ensure that all the necessary examination and tests, as specified in Appendix 4, are conducted to his/her satisfaction before he/she registers the pressure vessel with MOM. The AE may also carry out further examinations or tests deemed necessary to ensure the overall integrity of the pressure vessel before registering the pressure vessel.

¹ An owner shall be able to show proof of ownership of the pressure vessel, including provision of necessary documentation.

- 3.4 The owner shall retain the necessary documents to facilitate future repair or modification works on the pressure vessel until the vessel is no longer in use.

4. RE-REGISTRATION OF EXISTING PRESSURE VESSEL

- 4.1 An existing pressure vessel which was previously registered for use in a workplace (i.e. a pressure vessel registered with MOM and issued with a Report of Examination and Test by an AE), is required to be re-registered when:

- (a) There is change in pressure vessel ownership, i.e. change in the Unique Entity Number (“UEN”) of the pressure vessel’s owner; or
- (b) The pressure vessel (non-mobile units) has been moved from one workplace to another.

- 4.2 The AE shall ensure that all the necessary examination and tests, as specified in Appendix 5, are conducted to his/her satisfaction before he/she re-registers the pressure vessel with MOM. The AE may also carry out further examinations or tests deemed necessary to ensure the overall integrity of the pressure vessel before re-registering the pressure vessel.

- 4.3 A new owner buying or taking over a previously registered pressure vessel has to ensure that the vessel has been de-registered by the previous owner before doing so.

- 4.4 The re-registration process for existing pressure vessels is specified in Appendix 3.

5. DUTIES AND RESPONSIBILITIES OF OWNERS AND AUTHORISED EXAMINERS

- 5.1 Owners and AEs are to work together to ensure the pressure vessel is:
- (a) Designed, fabricated and tested in accordance with an accepted standard or code; and
 - (b) Of good construction, sound material, free from patent defects and safe for intended use.

Statutory Pressure Vessel Owners

- 5.2 The owner of a statutory pressure vessel shall ensure that the pressure vessel is designed, fabricated and tested in accordance with standards or codes accepted by MOM². Any pressure vessel designed, fabricated or tested based on other standards or codes will be assessed on a case-by-case basis.
- 5.3 The owner shall ensure adherence to the above guidance for both registration and re-registration of pressure vessels.
- 5.4 For pressure vessels fabricated overseas, each pressure vessel must be surveyed during the fabrication stage at the manufacturing site by an accredited Inspection Body³ ("IB") or an AE competent in the respective design code or standard. This is to ensure that the pressure vessel is designed, fabricated and tested in accordance with an accepted standard or code, of good construction, sound material, free from patent defects and safe for intended use.
- (a) The owner shall ensure that the IB is accredited to ISO/IEC 17020⁴ (as a third-party IB which meets Type A requirements under the accreditation scope of design verification and/or fabrication inspection of pressure vessel or equivalent) by Singapore Accreditation Council ("SAC") or SAC's Mutual Recognition Arrangement ("MRA") partners and verify the validity of the IB (as specified in Appendix 6). This can be done by requesting for a copy of the IB's accreditation documentation. Samples of IB's accreditation documentation are attached in Appendix 7 for reference.
- (b) The accredited IB or AE shall issue a fabrication survey report certifying that the pressure vessel has been fabricated and tested in accordance with an accepted standard or code.
- 5.5 For pressure vessels fabricated in Singapore, each pressure vessel must be surveyed by an AE or by an MOM inspector during the fabrication stage.

² The list of acceptable standards or codes can be found on MOM's website: <https://www.mom.gov.sg>.

³ MOM no longer accepts new application or renewal of existing Third-Party Inspection Agency ("TPIA") from 1 July 2018. However, MOM will continue to recognise the validity of the fabrication surveys carried out by the TPIAs within the previously approved periods. The list of approved TPIAs can be found on MOM's website.

⁴ ISO/IEC 17020 Conformity Assessment - Requirements for the Operation of Various Types of Bodies Performing Inspection.

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES (2024)

- 5.6 The owner shall ensure that the pressure vessel is examined and tested by an AE or an MOM inspector in accordance with the requirements of the WSHA and its subsidiary legislation, and is issued with a Report of Examination and Test issued by the AE, prior to using the pressure vessel at a workplace. An examination report shall be generated by MOM's online WSH e-Services portal in accordance with prevailing regulations and guidelines.
- 5.7 The owner shall retain the documents as specified in Appendix 2 and produce them for verification upon request by MOM or an AE.
- 5.8 The owner shall notify and seek approval from MOM before carrying out any repair or modification (including replacement, re-rating, de-rating, etc.) work on any pressure vessel.
- 5.9 The owner shall de-register the pressure vessel once it is no longer in use via MOM's online WSH e-Services portal.

Authorised Examiners

- 5.10 The AE shall review the documents as listed in Appendix 2 and ensure that they are in order and to his/her satisfaction, for the purpose of registration or re-registration of the pressure vessel. A copy of the documents shall be uploaded through the MOM's online WSH e-Services portal when registering or re-registering the pressure vessel.
- 5.11 For pressure vessels manufactured overseas, the AE shall verify that the pressure vessel had been surveyed by an accredited IB or an AE competent in the respective design code or standard, and a valid fabrication survey report had been issued specifically for that pressure vessel. The AE shall verify that the IB had obtained a valid ISO/IEC 17020 accreditation (Type A) by SAC or SAC's MRA partners with the scope of design verification and/or fabrication inspection of pressure vessel or equivalent, at the point of manufacture. This can be done by requesting a copy of the IB's accreditation documentation from the IB or the owner (as specified in Appendix 6).
- 5.12 The accreditation documentation (which includes the accredited IB's scope of accreditation and validity) issued by the respective SAC's overseas MRA partners

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES (2024)

a.k.a. National Accreditation Board (“NAB”) shall be uploaded through MOM’s online WSH e-Services portal. Samples of IB’s accreditation documentation are attached in Appendix 7 for reference.

- 5.13 By determining and conducting the necessary tests in accordance with this guideline, the AE is deemed to have verified and confirmed that the documents have met the acceptance criteria stipulated in Appendix 4 or Appendix 5.
- 5.14 The AE shall verify and ensure that the gas train for gas-fired steam boilers comply with the requirements of standards or codes accepted by MOM⁵ and are tested accordingly to verify its proper functionality.
- 5.15 The AE is responsible for exercising due diligence in his/her report or the conduct of any examination of a statutory pressure vessel and in accordance with requirements in WSHA, its subsidiary legislation or this set of guidelines.

6. RISK ASSESSMENT AND MANAGEMENT

- 6.1 Risk assessments shall be carried out to evaluate the safety and health risks faced by persons at work conducting various types of examinations and tests (e.g. radiography, UT, pressure test, etc.). Appropriate measures must be implemented and maintained to eliminate or reduce risks to as low as reasonably practicable.
- 6.2 The principal or employer is responsible for ensuring that a risk assessment is conducted by a team comprising representatives from the occupier, competent persons, equipment owner, equipment supplier, equipment operator, etc. The principal or employer shall also ensure that safe work procedures are implemented before carrying out such work. The safe work procedures shall include the safety precautions to be taken in the course of work and during an emergency; and the provision and use of necessary personal protective equipment.
- 6.3 The safe work procedures shall also be effectively communicated by the principal or employer to all relevant parties involved.

⁵ Do check for the latest acceptable standards or codes on MOM’s website: <https://www.mom.gov.sg>.

- 6.4 For more information on the conduct of risk assessments, please refer to the MOM website at www.mom.gov.sg.

APPENDIX 1 – GLOSSARY OF TERMS

- 1.1 Authorised Examiner (“AE”)** – Shall be certified by the Professional Engineers Board as a Specialist Professional Engineer in Pressure Vessel Engineering.
- 1.2 Conformity Assessment Bodies (“CABs”)** – Companies or agencies that conduct certification, testing, calibration and inspection of equipment for conformity to standards. Under the MRA, the CABs are accredited by their respective National Accreditation Boards (NABs) relevant to the respective ISO standards.
- 1.3 Design Check (“DC”)** – A design review to confirm that the design of the pressure vessel meets acceptable codes or standards.
- 1.4 Inspection Body (“IB”)** – CABs accredited to ISO/IEC 17020 – “General Requirement for the Operation of Various Types of Bodies Performing Inspection” (Third Party Services only) by the Singapore Accreditation Council (“SAC”) or SAC’s MRA partners for design verification and/or fabrication inspection of pressure vessels.
- 1.5 Mutual Recognition Arrangement (“MRA”)** – A global network of countries that recognises each other’s accredited CABs. Examples include the Asia Pacific Accreditation Cooperation (“APAC”), International Laboratory Accreditation Cooperation (“ILAC”), and International Accreditation Forum (“IAF”).
- 1.6 National Accreditation Board (“NAB”)** – A (national) body which provides accreditation services.
- 1.7 Positive Material Identification (“PMI”)** – Non-destructive chemical analysis performed on the body of the pressure vessel to confirm the material used is of a grade allowed in the fabrication of the pressure vessel. PMI shall be conducted by SAC-SINGLAS accredited testing laboratories.
- 1.8 Pressure Test (“PT”)** – Hydrostatic test conducted at a test pressure and duration in accordance with the accepted standards or codes to confirm the overall integrity of the pressure vessel. Do note that MOM cautions against the conduct of pneumatic or hydropneumatic tests in lieu of hydrostatic tests⁶.

⁶ There is a much larger amount of stored energy in compressed air or gases, than in liquids. When released in an uncontrolled or unintended manner, the energy could cause vessels to rupture and harm persons in the vicinity.

- 1.9 Radiography (“R”)** – Conducted by digital or conventional means to check for inherent defects on welding joints and seams of the pressure vessel. This test shall be conducted by SAC-SINGLAS accredited testing laboratories using appropriate radiography equipment.
- 1.10 Running Test (“RT”)** – Test of safety valves installed on the pressure vessel to ensure that the safety valves are of adequate design, set at the correct settings and operating as intended or designed for.
- 1.11 Singapore Accreditation Council (“SAC”)** – The national accreditation body in Singapore. It operates a range of accreditation programmes that provide independent assessment and formal recognition of the competence of companies in performing specific types of testing, calibration, inspection, certification and other related activities.
- 1.12 Ultrasonic Test (“UT”)** – Test to ensure that the thicknesses of various parts of the pressure vessel conform to the minimum thickness specified in the design. This test shall be conducted by SAC-SINGLAS accredited testing laboratories using appropriate equipment.
- 1.13 Visual Inspection (“VI”)** – A type of inspection to ensure that there are no physical defects on the visually accessible parts of the pressure vessel. Accessories or ancillary equipment should not be attached to the pressure vessel to facilitate this inspection. The AE shall also confirm the minimum safety devices as required under the Workplace Safety and Health Act and its subsidiary legislation are installed or supplied with the pressure vessel.

**APPENDIX 2 – DOCUMENTS TO BE SUBMITTED TO AUTHORISED EXAMINER AND
RETAINED BY OWNER FOR REGISTRATION AND RE-REGISTRATION OF PRESSURE
VESSEL**

The owner shall retain, but not limited to, the following documents at the premises where the statutory pressure vessel is being used:

Table 1a: Registration of New Pressure Vessel

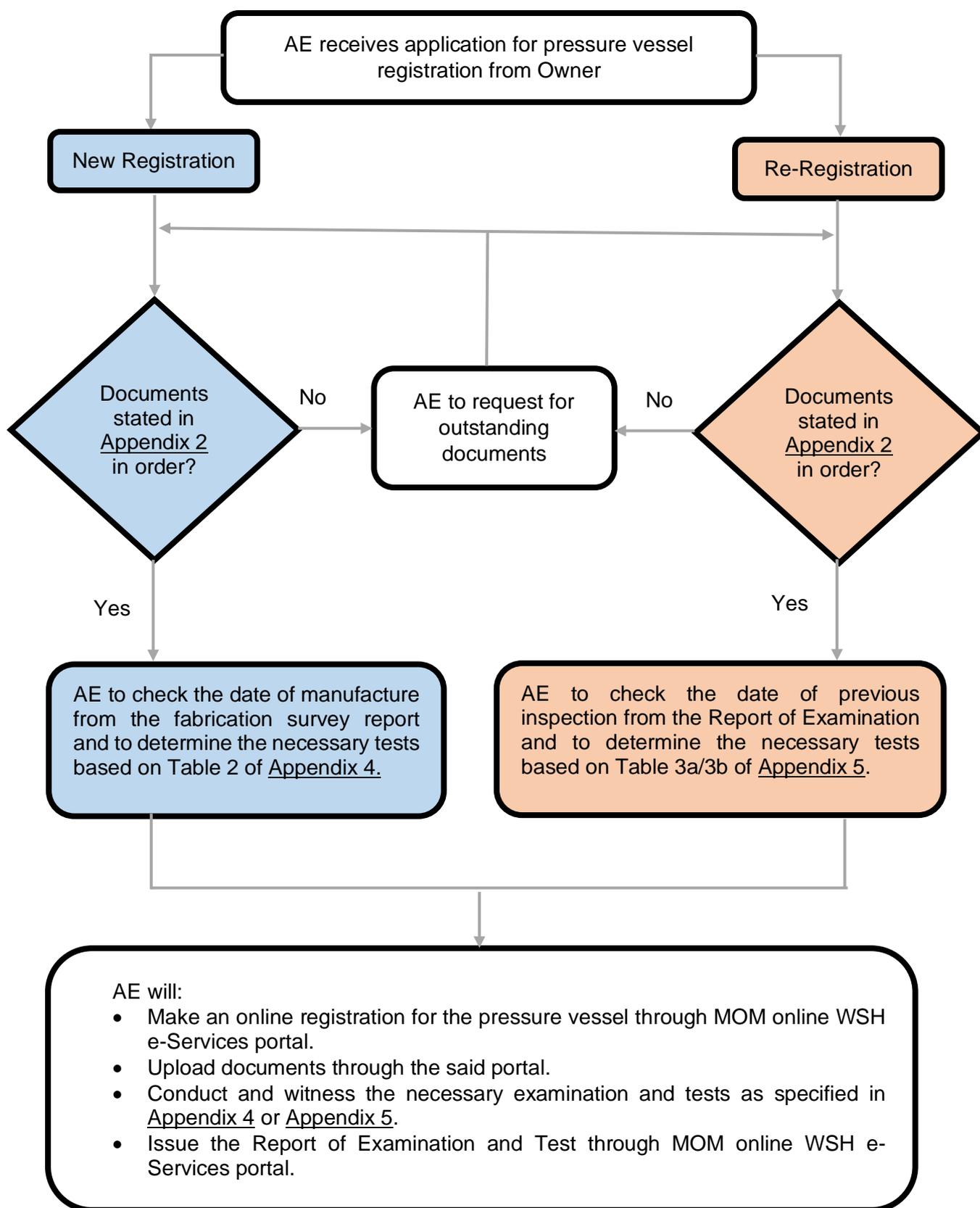
Documentary requirements for <u>Registration</u> of New Pressure Vessel	
1.	Construction drawings of pressure vessel, including welding details.
2.	Design calculations made to the accepted standards or codes, and endorsed by an accredited IB.
3.	Accreditation document from the accredited IB showing scope of accreditation and validity period.
4.	Layout plan of boiler house/room conforming to the latest edition of Singapore Standard SS 567 – Code of Practice for Factory Layout – Safety, Health and Welfare Considerations, or its equivalent.
5.	Steam piping diagrams, made in accordance with ASME B31.1/B31.3 or its equivalent.
6.	Gas train layout plan, made in accordance with standards and codes acceptable by MOM and approved by an AE, applicable to fired boilers.
7.	Original fabrication survey report issued by: <ul style="list-style-type: none"> a) an accredited IB or AE (for pressure vessel fabricated overseas); or b) an AE (for pressure vessel fabricated in Singapore).
8.	Supporting documents to prove ownership (e.g. Invoice, Delivery Order, etc.).

Table 1b: Re-Registration of Existing Pressure Vessels

Documentary requirements for <u>Re-registration</u> of Existing Pressure Vessels	
1.	Previous Report of Examination of the pressure vessel issued by an AE.
2.	Past registration documentation.
3.	Previous reports of Non-Destructive Examination (“NDE”) conducted ⁷ .

⁷ If past examination reports/records are not available, new examination(s) shall be conducted to affirm the overall integrity of the pressure vessel.

APPENDIX 3 – PROCESS FLOW FOR REGISTRATION OF NEW PRESSURE VESSEL / RE-REGISTRATION OF EXISTING PRESSURE VESSEL



APPENDIX 4 – LIST OF REQUIRED TESTS FOR REGISTRATION OF NEW PRESSURE VESSEL

Table 2: Criteria for registration of new statutory pressure vessel

Types of Pressure Vessels
1. Steam Boiler (“BR”) (Electric & Non-Electric)
2. Economiser (“BE”)
3. Superheater (“BS”)
4. Air Receiver (“AR”)
5. Steam Receiver (“SR”)
6. Refrigerating Plant Pressure Receiver (“PR”)

Issuance of Fabrication Survey Report	Date of Issuance of Report	Exemptions	Required Tests						
			DC	PMI	UT	R	VI	PT	RT
No fabrication survey report or report not endorsed by accredited IB	--	--	✓	✓	✓	✓	✓	✓	✓
Fabrication survey report issued (as of registration date)	More than 10 years	--			✓	✓	✓	✓	✓
	2 years or more but less than 10 years	For electric autoclaves, UT & PT are exempted. For AR/SR/PR, PT is exempted.			✓		✓	✓	✓
	Less than 2 years	For AR/SR/PR & electric autoclaves, PT is exempted.					✓	✓	✓

APPENDIX 5 – LIST OF REQUIRED TESTS FOR RE-REGISTRATION OF EXISTING PRESSURE VESSEL

Table 3a: Criteria for re-registration of existing statutory pressure vessels (AR, SR, PR, and Autoclaves)

Issuance of Report of Examination	Exemptions	Required Tests						
		DC	PMI	UT	R	VI	PT	RT
Air Receivers (“AR”)	Last Inspection conducted more than 10 years ago			✓	✓	✓	✓	✓
Steam Receivers (“SR”)	Last UT and PT conducted more than 10 years ago			✓		✓	✓	✓
Refrigerating Plant Pressure Receivers (“PR”)	Last UT and PT conducted less than 10 years ago					✓		✓
Autoclaves	Last Inspection conducted more than 10 years ago			✓	✓	✓	✓	✓
	Last UT and PT conducted more than 10 years ago					✓	✓	✓
	Last UT and PT conducted less than 10 years ago					✓		✓

Table 3b: Criteria for re-registration of existing statutory pressure vessels (BR, BE and BS)

Issuance of Report of Examination	Exemptions	Required Tests						
		DC	PMI	UT	R	VI	HT	RT
Steam Boilers (“BR”)	Last Inspection conducted more than 10 years ago			✓	✓	✓	✓	✓
Economisers (“BE”)	Last UT and PT conducted more than 10 years ago			✓		✓	✓	✓
Superheaters (“BS”)	Last UT and PT conducted less 10 years ago					✓	✓	✓

APPENDIX 6 – ACCREDITED INSPECTION BODIES

1. Accredited IB refers to CABs accredited to ISO/IEC 17020 – “General Requirement for the Operation of Various Types of Bodies Performing Inspection” (Third Party Services only) by the SAC or SAC’s MRA partners for **design verification and/or fabrication inspection of pressure vessels**.
2. MRA is a global network of countries that recognises each other’s accredited CAB. CABs are companies or agencies that conduct certification, testing, calibration and inspection of equipment for conformity to standards. Under the MRA, the CABs are accredited by their respective NABs relevant to the respective ISO standards. In Singapore, the MRA is administered by SAC.

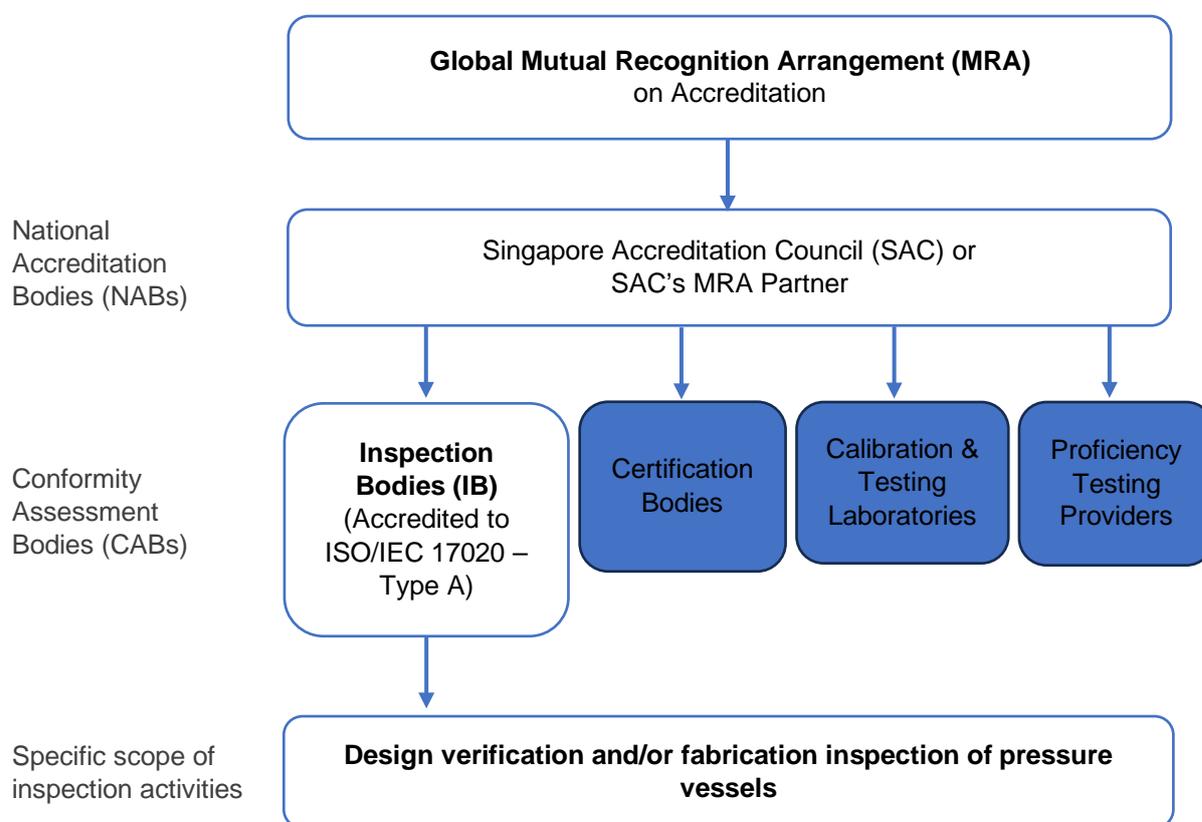


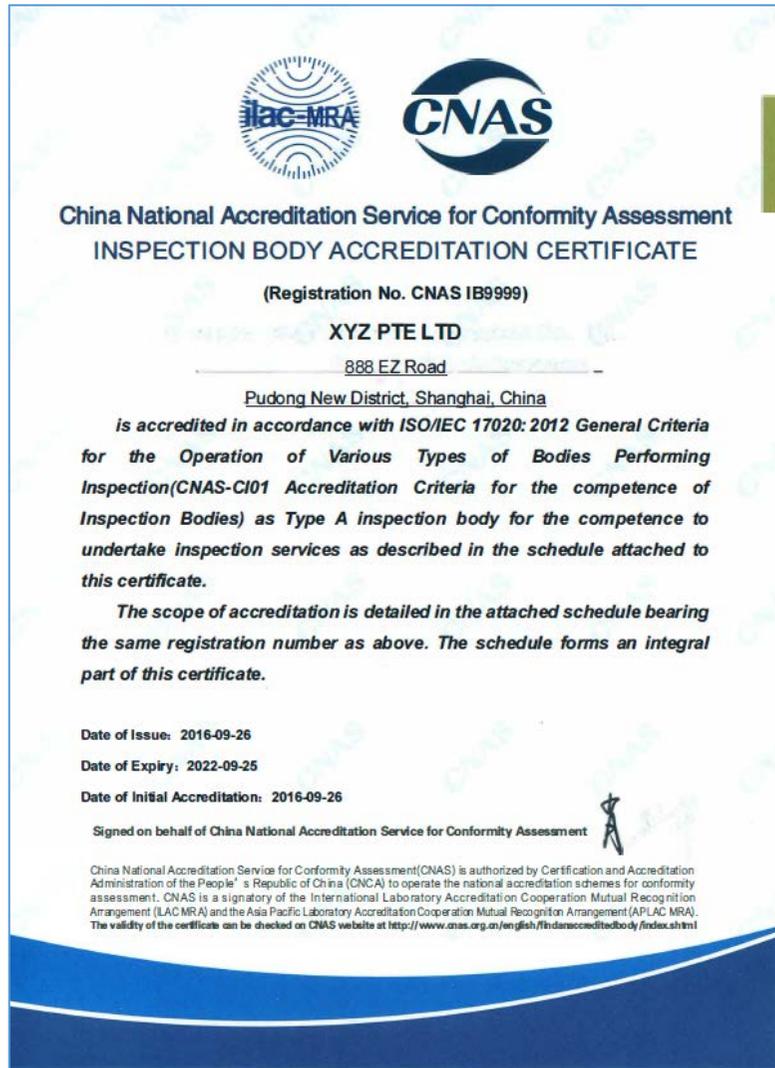
Figure 6: Accreditation Framework

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES (2024)

3. The owner is to engage an IB which has obtained ISO/IEC 17020 accreditation by SAC or SAC's MRA partners for design verification and/or new fabrication inspection of pressure vessels.
4. The AE shall verify that the IB has a valid ISO/IEC 17020 accreditation by SAC or SAC's MRA partners with the scope in design verification and/or fabrication inspection of pressure vessels or equivalent. This can be done by requesting a copy from the IB or the owner or through SAC's MRA website.
5. Please refer to the SAC's website to view the latest list of SAC's MRA partners.
6. The list of accredited IBs can be found in respective NAB's website.

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES (2024)

APPENDIX 7 – SAMPLES OF ACCREDITATION DOCUMENTATION



ISO/IEC 17020 认可证书

№	Field of Inspection	Type and Range of Inspection		Standard/Method or Procedures	Note
		№	Name		
4	Pressure Equipment	1	Design Review	ASME BPV Code, Section I, Power Boilers 2017	Accredited only for conformity design review according to client request.
				ASME BPV Code, Section VIII-1, Pressure Vessels 2017	
				ASME BPV Code, Section VIII-2, Pressure Vessels, Alternative 2017	
				ASME BPV Code, Section IV, Heating Boilers 2017	
				ASME B31.1, Power Piping 2016	
				PED 2014/68/EU 2014	
				API 650 2016	

No. CNAS IB9999

第 3 页 共 3 页

The scope of the accreditation in Chinese remains the definitive version.

在线扫码获取验证

Note: Do ensure that the survey and inspection activities were carried out within the validity period of the Inspection Body.

GUIDELINES FOR REGISTRATION OF PRESSURE VESSELS IN WORKPLACES (2024)

National Accreditation Board for Certification Bodies



INSPECTION BODY

Accreditation Certificate

NABCB hereby confirms that

XYZ PTE LTD
888 EZ Road
Mumbai – 888888 India

Complies with NABCB Accreditation Criteria for Inspection Bodies
and is accredited in accordance with

**International Standard ISO/IEC 17020:2012
as Type 'A' Inspection Body**
to provide Inspection Services as per
Approved Scope of Accreditation described in Schedule I
and from its Office(s) described in Schedule II

Accreditation Certificate Number : **IB 999**
Date of Initial Accreditation : 30 September 2013
Date of Last Renewal : 30 September 2016
Validity of Accreditation : 29 September 2020

[Signature]
CEO
24 September 2016
Issue Date

(Please visit www.qcni.org/nabcb for update on the Scope or the Validity of Accreditation. You may also contact CEO, NABCB for any related information.)

National Accreditation Board for Certification Bodies



INSPECTION BODY

Schedule I : Scope of Accreditation

XYZ Pte Ltd.

Field of Inspection	Type and Range of Inspection	Standards / Regulations / Methods / Procedures	
		Number identification with year of publication	Title
		ASTM A 106 :2015	and ERW pipes • Spec for tubular • Standard Specification for Seamless Carbon Steel Pipe
• Ductile Iron Pipes			• BS - British Standard for Ductile iron pipe • ISO- International Standard for Ductile iron pipe, • IS -Indian Standard for Ductile iron pipe
Fabricated Metal Products • Pressure vessels - like Vessels, Distillation columns, storage tanks, process equipment etc.		ASME -Sec. VIII IS 2825 – PD 5500 API 510: 2014, API 572: 2009, ASME Sec IX : 2015 , ASME Sec V: 2015 , ASME Sec VIII: 2015	• Rules for the construction of pressure vessels • Indian Standard for unfired pressure vessels • British standard specification for unfired fusion welded pressure vessel • Pressure Vessel Inspection Code: • ASME Boiler and Pressure Vessel Code • TEMA - Tubular Exchanger Manufacturers Association- Standard for Design and construction of Heat Exchangers
• Heat Exchanger			
• Boilers		IBR -1950	IBR -1950 -Indian Boiler Regulation

[Signature]
CEO
Page 2 of 6
24 September 2016
Issue Date

(This schedule must be accompanied by the Accreditation Certificate No. IB017 valid upto 29 September 2020)