



DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH, MALAYSIA

Guidelines For Design Approval Application Of Steam Boiler and Fired Pressure Vessel

1.0 Introduction

Each steam boiler and fired pressure vessel installed and operate in this country shall have a valid certificate of fitness (CF). Hence, the steam boiler and fired pressure vessel shall first obtain design approval from the Department of Occupational Safety and Health, Headquarters before fabrication, installation or operation

2.0 Interpretation

The interpretation of "steam boiler" under Act 139, Factories and Machinery Act, 1967, Section 3:

"steam boiler" means any closed vessel in which for any purpose steam is generated under pressure greater than atmospheric pressure, and includes any économiser used to heat water being fed to the vessel, and any superheater used for heating surface, and any pipes and fittings connected thereto ".

The interpretation of " fired pressure vessel " under Act 139, Factories and Machinery Act, 1967, Section 3:

" fired pressure vessel " means an enclosed vessel under pressure greater than atmospheric pressure which is subjected to direct firing, but does not include a steam boiler.

The following are several examples of steam boilers and fired pressure vessel which must be registered:

- i) Autoclave
- ii) Electric Steam Boiler
- iii) Water Tube Steam Boiler
- iv) Fire Tube Steam Boiler
- v) Heat Recovery Steam Generator (HRSG)
- vi) Hot Water Boiler
- vii) Thermal Oil Heater

3.0 Purpose

- i) To provide guidance for the applicant on the application procedure for design approval of steam boiler and fired pressure vessel
- ii) To assist applicants to understand the requirements for design approval of steam boiler and fired pressure vessel so that the design is complied with the recognized standards.

4.0 Application Requirements

i) Fabrication Of Steam Boiler And Fired Pressure Vessel

All locally made steam boiler and fired pressure vessel must be fabricated by a competent firm registered with the Department of Occupational Safety and Health (DOSH).

Meanwhile, all imported steam boiler and fired pressure vessel shall be fabricated by a firm recognized by inspecting authorities or any authorize agency in the origin country.

ii) Modification

Application for modification shall be submitted to the Department of Occupational Safety and Health, Headquarters for approval. The modification can be carried out by a competent firm registered with the Department of Occupational Safety and Health (DOSH) or origin manufacture. The details of propoesd modification on steam boiler and fired pressure vessel must be clearly explained by the applicant.

The scope of modification is the work involves cutting, welding, patching or riveting of any member thereof which is subject to a stress induced by fluid pressure **other than the repair scope** as follows:

- a. without changes on the original design which has been approved by the Department or,
- b. with the changes allowed on the original design which has been approved by the Department namely:
 - i) Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of

construction. The minimum required thickness shall be at least equal to the original material thickness.

- ii) Replacement of slip –on flanges with weld neck flanges or vice versa
- iii) The installation of a flush patch to a pressure-retaining item
- iv) Installation of new nozzles of such a size and connection type that reinforcement and strength calculations are not a consideration required by the original code of construction
- v) The addition of a nozzle where reinforcement is a consideration may be considered to be a repair, provided the nozzle is identical to one in the original design, located in a similar part of the vessel, and not closer than three times its diameter from another nozzle.
- vi) In the boiler, a change in the arrangement of tubes in furnaces walls, economizers or superheater sections

5.0 Application

Applications must be made through online application system, Sistem Kawal Urus Dokumen Versi 3 (SKUD V3) which can be accessed via (<http://skud.dosh.gov.my:88/default.aspx>) which can be accessed through Internet Explorer (IE) browser only.

Details of the application documents are as follows:

Appendix 1: Documents For Design Approval Application Of Steam Boiler or Fired Pressure Vessel (Import / Local)

Appendix 2: Documents For Modification Approval and Permission Application Of Steam Boiler or Fired Pressure Vessel

6.0 Client Charter

Applications submitted with complete documents will be processed within **30 working days** from the date of submission.

7.0 Question

Any questions may be directed to:

Unit Head - Steam Boiler,

Design Section,

Industrial Safety Division,

Level 3, Block D4, Complex D,

Federal Government Administrative Centre,

62530 Putrajaya.

Tel : +603-8886 5325

Fax: +603-8889 2349

Appendix 1:

Documents For Design Approval Application Of Steam Boiler or Fired Pressure Vessel (Import / Local)

1. A letter of design approval application by the manufacturer, supplier or owner.
 - a. An official letter from the applicant addressed to the Director General.
 - b. Please indicate the general specifications such as the type, model, capacity, heating surface / heating power.
2. A design review certificate by the Inspecting Authority gazetted in the Fourth Schedule, Factories And Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations, 1970.
3. Design drawing including general arrangement drawings (GA) and detailed drawings of each pressurized parts endorsed the Inspecting Authority. The following information shall be included inside the design drawings:
 - a. Design data such as design pressure, design temperature, operating pressure, operating temperature, test pressure, latest design code, nondestructive testing (NDT), work medium, heating surface, heating power, evaporation capacity and others.
 - b. Main dimensions
 - c. Welding details
 - d. Orientation, dimensions and functions for each 'nozzle'.
 - e. Detail of material specifications
 - f. Essential fittings
4. Design calculation based on the latest edition of design code which is gazetted in the First and Second Schedules, Factories And Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations, 1970
5. A checklist of Essential Fittings in **Appendix A**.
6. Piping and Instrument Diagram (P&ID) (**Autoclaves and Electric Steam Boilers**)
7. Catalogue and nameplate containing technical specifications such as heating power (kW) and capacity (liter) - (**Autoclaves and Electric Steam Boilers only**)
8. Hydrostatic Test certificate or any testing form or verified document that proves the machine has been tested at the manufacturer's (**Table Top Autoclaves only**)

Appendix 2:

Documents For Modification Approval and Permission Application Of Steam Boiler or Fired Pressure Vessel

1. A letter of modification approval application by the manufacturer or owner.
 - a. An official letter from the applicant addressed to the Director General
 - b. General specifications such as the type, model, capacity, heating surface etc
 - c. Details on the scope of the modification, which included part involved, dimensions, materials, quantities etc.
2. A design modification review certificate by the Inspecting Authority gazetted in the Fourth Schedule, Factories And Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations, 1970
3. Modified design drawing including general arrangement drawings (GA) and detailed drawings of each pressurized parts endorsed by the Inspecting Authority. The following information shall be included in the design drawings:
 - a. Design data such as design pressure, design temperature, operating pressure, operating temperature, test pressure, latest design code, nondestructive testing (NDT), work medium, heating surface, heating power, evaporation capacity and others.
 - b. Main dimensions
 - c. Welding details
 - d. Orientation, dimensions and functions for each 'nozzle'.
 - e. Detail of material specifications
 - f. Essential fittings
 - g. Piping and Instrumentation Diagram (P & ID)
4. An original design drawing which has been previously approved by the Department.
5. Design calculation on modification part based on the design code which is gazetted in the First and Second Schedules, Factories And Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations, 1970
6. Certificate of Fitness (CF)
7. Letter of registration as Competent Firm with the Department or confirmation letter as the original manufacturer
8. Safe Operating Procedures for the modification work
9. WPS, PQR and WQT
10. A full report by the manufacturer or owner which justify the need for such modification and the recommendations

Appendix A:**Checklist of 13 Essential fittings under Regulation 10, Factories And Machinery (Steam Boiler And Unfired Pressure Vessel) Regulations, 1970**

Type of boiler :					
Model :					
Confirmation from the Manufacture : (Name, Signature & Company Stamp)					
No.	Essensial fittings	Yes (/)	No (/)	Quantity	Provide reason if answer is "No" by referring design code
1.	Two (2) or more Safety Valve for heating surface > 9.29 m ²				
2.	Two (2) Water Gauges for evaporative capacity > 136 kg/hr & temperature 100 °C)				
3.	One (1) Steam Pressure Gauge				
4.	One (1) Blow Down Valve Or Cock				
5.	Two (2) Feed Pump or alternatively one feed pump and one injection for heating surface > 13.94 m ²				
6.	One (1) Main Steam Stop Valve				
7.	One (1) Feed Check Valve				
8.	One (1) Inspector's Test Pressure Gauge Attachment				
9.	One (1) Fusible Plug (exemption for boiler fired with liquid or gaseous fuel)				
10.	One (1) Low Water Alarm (exempt: solid fuel at pressure < 250psi (1724 kpa) or liquid or gaseous fuel and fitted with low water fuel cut out)				
11.	One (1) Low Water Fuel Cut-out for boiler is fired with liquid or gaseous fuel				
12.	Name Plate				
13.	Registration Plate				