

## Work Process Schedule

Occupational Title: BOILER/PRESSURE VESSEL INSPECIOR  
O\*NET-SOC Code 13-1041.05

Description: A Boiler/Pressure Vessel Inspector is responsible for the enforcement of the Boiler and Pressure Vessels Act its Administrative Rules and Codes which govern the design, f construction, installation, maintenance and repair of boilers and pressure vessels in both conventional and nuclear service.

### On-The-Job Training

The apprenticeship will practice the following work processes, demonstrating competency in them over the course of the two years of the program. This constitutes the on-the-job training portion of the apprenticeship. Each general work process is thither broken down into specific constituent processes for clarification.

### Work Processes      Approximate flours

#### 1. SAFETY    500

- Attends required training on safety topics such as confined space entry procedures, lighting, lockout tag-out, fall protection and asbestos awareness;

#### 2.      PREPARES FOR AND PASSES NATIONAL BOARD EXAMINES    500

- Studies and becomes familiar with ASME Codes;
- Calculates allowable limits of pressure, strength, and stresses by using applicable ASME Codes;
- Successful competition of examinations for National Board Commission with an "A" and/or "B" endorsement;

#### 3. PLANNING AND SCHEDIJUNG OF WORK200

- Plans and schedules work by reviewing inspection records, contractors request and shop activities to ensure that the inspection schedule and remedial actions conform to ASME Codes and State regulations;
- Plans work for maximum efficiency of travel by reviewing past due, scheduled inspections and shop activities;

#### 4. PERFORMES INSPECTIONS - FIELD 1,200

- Enforces the Boiler and Pressure Vessels Act, its Administrative Rules and Codes which govern the design, fabrication, construction, installation, maintenance and repair of boilers and pressure vessels in both conventional and nuclear service;
- Obtains the correct name and address of owner/user for new vessels and verifies name and address of existing equipment during re-inspection;
- Inspects boiler/pressure vessel nameplate to verify that ASME code stamping, National Board registration, and all required data are properly displayed;
- Checks existing vessels for identification and verifies NC numbers and attaches NC numbers to new vessels;
- Explains requirements of the ASME Code and Uniform Boiler and Pressure Vessel Act to owners and users in a professional and courteous manner;
- Inspects the general condition of boilers and pressure vessels, including all external surfaces, for evidence of leakage, cracks, blisters, bulging, or other signs of discontinuities;
- Verifies that adequate provisions are provided for the expansion of hot water in hot water heating systems;
- Verifies that high limit switches are properly installed (temperature limit for hot water or pressure limit for steam boilers and pressure vessels);
- Inspects external piping to the code boundaries;
- Verifies adequate clearances are available for inspection, repair, and operation and checks for the presence of hazardous or highly flammable material near a fired boiler or pressure vessel;
- Verifies adequate ventilation and combustion air supply for fired boilers or pressure vessel;
- Verifies capacity, set pressure and stamping on safety valves are correct and where applicable witness functional test;
- Verifies location and checks operation of low water fuel cutoff for boilers;
- Verifies that a pressure gauge of suitable range is installed on pressure vessels and boilers, for steam boilers that a gauge cock and siphon is installed and for hot water heating boilers that a temperature/pressure gauge is installed;

- Verifies that a temperature gauge is installed to indicate outlet temperature for all hot water supply boilers
- Verifies that the stop and check valve is properly installed in feed water or make-up water supply line to the equipment
- Witness hydrostatic test to determine the suitability of the boiler or pressure vessel to operate at the specified operating pressure
- Performs ultrasonic thickness measurement of pressure retaining material for boilers and pressure vessels
- Performs calculations to determine the maximum allowable working pressure of nonstandard boilers and pressure vessels
- Performs internal inspections of pressure vessels to verify condition of head and shell surfaces and any internals
- Performs internal inspections of boilers to verify the internal condition of tubes, water legs, steam drums, mud drums, and steam headers
- Explains to the owner/user any repairs for improving the boiler or pressure vessel that must be completed prior to issuance of certificate
- Calculates and explains to the owner/user the amount of the inspection fee and process by which an inspection certificate is issued
- Enhances safe and reliable operation by reviewing maintenance and operating logs
- Completes and verifies all entries on the inspection report by use of applicable inspection check list
- Conducts special investigations of incidents and complaints by utilizing knowledge of Uniform Boiler and Pressure Act of NC and gathering information to determine causes and develop methods of preventing reoccurrence
- Confers with engineers, manufactures, contractors, owners, and operators concerning problems in construction, operation, and repair of boilers and pressure vessels

#### 5. PERFORMES INSPECTIONS - SHOP 1,000

- Ensures manufacturer has a valid American Society of Mechanical Engineers (ASME) Certificate of Authorization, National Board of Boiler Certificate of Authorization (URU Stamp)
- Verifies manufacture has access to the necessary ASME Code books, National Board;

### Inspection code and referenced standards

- Reviews and ensures that the manufacturers work follows an accepted Quality Control System by reviewing owner/user's Quality Documentation Plan
- Reviews design calculations and drawings for Code compliance
- Determines and sets hold points by review of job planning documents
- Determines compliance with Quality Control Manual requirements
- Ensures welders and welding procedures used in code are qualified under the requirements of the Uniform Boiler and Pressure Vessel Act
- Reviews purchasing and receiving documents and Material Test Reports (MTR) and/or markings to ensure material complies with code, and the material is suitable for use in accordance with the construction code and design documents
- Verifies that material markings are being transferred in accordance with the Code and with the Manufacture's Quality Control System (QCS)
- Verify manufactures are examining cut edges as required by code
- Verify all Welding Procedure Specifications (WPS), Procedure Qualification Records (PQR) and Welder and Welding Operator Qualification Records (WPQ) that are being used are properly documented
- Determines if fit-up tolerances meet Code requirements
- Verify base metal and weld metal defects are properly repaired
- Verify heat treatments, nondestructive examinations, and tests are property performed and the results are acceptable
- Measures weld dimensions and reinforcement to determine if weld sizes meet drawings by using welding gages
- Witnesses Code required hydrostatic / pressure tests
- Witnesses any proof test used to establish maximum allowable working pressure (MAWP)
- Verifies manufactured or repaired boiler/pressure vessel is in compliance with Code prior to authorizing application of the ASME Code stamp or National Board "R" Stamp
- Verifies nameplate or stamping is correctly applied by visual inspection

- Satisfies that all code requirements are met before reviewing and signing Manufacturer's

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- Data Report, or Report of Welded Repair or Alteration
- Maintains bound diary of shop activities by entering date, job identification, inspection activities performed, deficiencies and discussions held with manufacturer
- Completes shop inspection report for all shop inspections
- Verifies manufactures Quality Control System is adequate to comply with code by monitoring annually and recording results in monitoring log and bound diary
- Reviews proposed changes to manufactures Quality Control Manual and, if found acceptable, signs off on owner/user's revised QC manual

#### 6. ADMINISTRATION 400

- Completes daily inspection report by listing all sites visited each day
- Completes monthly reports such as time and attendance, leave request and travel reimbursement and mails copy to Raleigh
- Keeps records and prepares reports of inspections and investigations for administrative or legal authorities

#### 7. QUALITY IMPROVMENT 200

- Obtains Certificate of Completion of Boiler Safety Bureau Quality Program by reading and understanding Quality Systems Manual
- Suggests improvements in work methods and procedures
- Assists management in the formulation of policy for the inspection, manufacture, installation and operation of boilers and pressure vessels as required by the Uniform Boiler and Pressure Vessel Act and Administrative Rules
- Provides input into the Legislative requirements relating to boiler and pressure vessel safety

Total hours 4,000

## TASK ANALYSIS

### BOILER/PRESSURE VESSEL INSPECTOR DOT1FT

oWftCODE I3-jo

## SAFETY

Attends required training on safety topics such as confined space entry procedures, lighting, lockout tag-out, fall protection and asbestos awareness.

## PREPARES FOR AND PASSES NATIONAL BOARD EXAMINES

Studies and becomes familiar with ASME Codes.

Calculates allowable limits of pressure, strength, and stresses by using applicable ASME Codes Successful competition of examinations for National Board Commission with an "A" and/or "B" endorsement.

## PLANNING AND SCHEDULING OF WORK

Plans and schedules work by reviewing inspection records, contractors request and shop activities to ensure that the inspection schedule and remedial actions conform to ASME Codes and State regulations.

Plans work for maximum efficiency of travel by reviewing past due, scheduled inspections and shop activities

## PERFORMES INSPECTIONS - FIELD

Enforces the Boiler and Pressure Vessels Act, its Administrative Rules and Codes which govern the design, fabrication, construction, installation, maintenance and repair of boilers and pressure vessels in both conventional and nuclear service.

Obtains the correct name and address of owner/user for new vessels and verifies name and address

of existing equipment during re-inspection. \_\_\_\_\_

Inspects boiler/pressure vessel nameplate to verify that ASME code stamping, National Board registration, and all required data are properly displayed.

Checks existing vessels for identification and verifies NC numbers and attaches NC numbers to new vessels.

Explains requirements of the ASME Code and Uniform Boiler and Pressure Vessel Act to owners and users in a professional and courteous manner.

Inspects the general condition of boilers and pressure vessels, including all external surfaces, for evidence of leakage, cracks, blisters, bulging, or other signs of discontinuities

Verifies that adequate provisions are provided for the expansion of hot water in hot water heating systems.

Verifies that high limit switches are properly installed (temperature limit for hot water or pressure limit for steam boilers and pressure vessels).

Inspects external piping to the code boundaries.

Verifies adequate clearances are available for inspection, repair, and operation and checks for the presence of hazardous or highly flammable material near a fired boiler or pressure vessel. Verifies adequate ventilation and combustion air supply for fired boilers or pressure vessels Verifies capacity, set pressure and stamping on safety valves are correct and where applicable witness functional test.

Verifies location and checks operation of low water fuel cutoff for boilers