INSPECTION of PRESSURE VESSELS for HUMAN OCCUPANCY BSB 0600-08

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BOILER SAFETY BUREAU

STANDARD OPERATING PROCEDURE MANUAL

1.0 PURPOSE

This procedure provides guidelines for the inspection of pressure vessels designed for human occupancy (PVHO).

2.0 SCOPE

This procedure applies to North Carolina Commissioned Inspectors in performance of inspections of PVHO, such as submersibles, diving bells, personal transfer capsules, decompression chambers, hyperbaric chambers, high altitude chambers and medical hyperbaric oxygenation facilities.

3.0 PERSONNEL RESPONSIBILITIES

3.1 The Bureau Chief – BSB has the overall responsibility for the implementation of this section.

3.2 The Assistant Bureau Chief is designated as the primary document custodian and is responsible for the control of documents.

3.3 The Commissioned Inspector should follow these guidelines to effectively inspect PVHO's.

4.0 HEALTH and SAFETY ISSUES

4.1 The purpose of this procedure is to guide inspectors through the process of inspecting these particular objects. This will aid the inspector in performing thorough and effective inspections which will promote the safe operation of the object(s).

4.2 The inspector may be subject to tight spaces during internal inspections of PVHOs. The inspector shall use caution entering these areas, ensuring the environment is safe to enter and utilizing an attendant if necessary. The inspector must reference BSB 0200-07 Confined Space Entry and BSB 0200-08 Tagout/Lockout Procedures when applicable.

5.0 PROCEDURE

5.1 Inspection of PVHO's.

5.1.1 Ensure the installation allows adequate clearance to conduct a proper inspection.

5.1.2 Verify the PVHO was constructed to ASME PVHO-1 and PVHO-2 Codes and bears the "U" or "U2" designator. ***NOTE**- Some PVHOs are constructed to Code Cases and may not have all the forms listed in this SOP and checklist. Forms required by the Code Cases must be included.

5.1.3 Perform an internal inspection where existing openings permit. Look for cracks, paying close attention to areas of high stress, such as welds, transitions, sharp corners, and interior surfaces opposite of exterior attachments. The internal vessel surfaces should be free of damage and corrosion.

5.1.4 Perform an external inspection and verify the exterior vessel surfaces are free of damage and corrosion. Due to potential condensation and moisture buildup, the bottom areas should receive special focus, especially where insulation exists. These areas can have a higher corrosion rate compared to others. The insulation may need to be removed for proper inspection. It is recommended that insulated vessels be inspected with the insulation removed once per year. Ensure that no cast or ductile iron fittings are being used.

5.1.5 Each acrylic window should be individually identified and traced to the PVHO documents. If there are any penetrations through the acrylic, they must be circular. Ensure the acrylic is free of crazing, cracks and scratches. ***Acrylic cylindrical windows have a design life span as defined in ASME PVHO-1, 2-2.7.7, and PHVO-2, 2-4.4. The design life span may be extended per PVHO-2, 2-7.***

5.1.6 Inspect the pressure relief devices. They shall be constructed in accordance with North Carolina Rules, and ASME Code Section VIII. The pressure relief device must have a quick opening manual shut-off installed between the chamber and the pressure relief device, with a frangible seal, within reach of the operator. This valve can prevent rapid decompression of the chamber, mitigating injury to the occupant. Ensure the pressure relief devices discharge to a safe point outside the building. This will aid in preventing pure oxygen from entering the building should the relief valve discharge during a fire.

5.1.7 Verify all PVHO documents are available and are properly traced to the vessel and acrylic parts. ***NOTE**- Some PVHOs are constructed to Code Cases and may not have all the forms listed in this SOP and checklist. Forms required by the Code Cases must be included.

5.1.8 Utilize the PVHO Checklist (Attachment 1) found on the Boiler Safety Bureau Intranet site.

6.0 CUSTOMER SERVICE REQUIREMENTS

The Inspector is expected to perform effective inspections of PVHO's for the protection of the occupants, staff and the general public in the vicinity of the vessel.

7.0 DATA and RECORD MANAGEMENT

Records shall be maintained in accordance with the Functional Schedule for North Carolina State Agencies as adopted by State Archives, a Division of the North Carolina Department of Natural and Cultural Resources