**Section 505.2500 Repairs and Alterations**

Repairs and alterations of non-ISI boilers and pressure vessels, and repairs of pressure relief valves associated with non-ISI boilers and pressure vessels, except boilers and pressure vessels and those pressure relief valves associated with boilers and pressure vessels that are exempt under Section 505.50(a), shall be made in accordance with this Section. The requirements of this Section are subject to the limitations of Section 505.20(c).

a) Non-ISI boilers and pressure vessels that are repaired or altered shall be repaired or altered in accordance with the National Board Inspection Code or this subsection (a). The requirements of this subsection (a) are limited to welded repairs and welded and non-welded alterations of non-ISI boilers and pressure vessels. When requirements for a repair or alteration are not given, it is intended that, subject to approval of the Authorized Inspector, details of design and construction, insofar as practical, will be consistent with the ASME Code for boilers and pressure vessels constructed to the ASME Code, or the code to which the item was originally constructed for boilers and pressure vessels not constructed to the ASME Code or the repair or alteration rules of the National Board Inspection Code.

1) All non-ISI boilers and pressure vessels covered by the Act that are repaired shall be repaired by one of the following organizations:

A) An owner and those organizations under contract to the owner, provided that:

i) the repairs are made in accordance with a Quality Assurance Program that meets the requirements of 10 CFR 50 Appendix B (2007) and has been approved by the NRC;

ii) all portions of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (a)(1)(A)(i), that are applicable to a repair activity are applied to the repair; and

iii) the owner notifies the Agency of its intention to apply 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (a)(1)(A)(i), to the repair of boilers and pressure vessels. This notification only needs to be given once for all repairs of boilers and pressure vessels performed under the owner's 10 CFR 50 Appendix B Quality Assurance Program at the nuclear facility.

AGENCY NOTE: The application of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsections (a)(1)(A)(i), (ii) and (iii), is subject to review by the Authorized Inspector.

B) An organization in possession of a valid "R" Certificate of Authorization issued by the National Board.

C) An organization authorized by the Division of Boiler and Pressure Vessel Safety, Office of the State Fire Marshal, to repair boilers and pressure vessels.

2) Repairs shall be initiated only after they have been authorized by the Authorized Inspector who has reviewed and accepted the weld procedures, welders and welding operators' qualifications and repair methods. The Authorized Inspector may give prior approval for repairs of a routine nature. In every case the Authorized Inspector shall be advised of each repair under prior agreement.

3) All non-ISI boilers and pressure vessels covered by the Act that are altered shall be altered by one of the following organizations:

A) An owner and those organizations under contract to the owner, provided that:

i) the alterations are made in accordance with a Quality Assurance Program that meets the requirements of 10 CFR 50 Appendix B and has been approved by the NRC;

ii) all portions of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (a)(3)(A)(i), that are applicable to an alteration activity are applied to the alteration; and

iii) the owner notifies the Agency of its intention to apply 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (a)(3)(A)(i), to the alteration of boilers and pressure vessels. This notification only needs to be given once for all alterations of boilers and pressure vessels performed under the owner's 10 CFR 50 Appendix B Quality Assurance Program at the nuclear facility.

AGENCY NOTE: The application of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsections (a)(3)(A)(i), (ii) and (iii), is subject to review by the Authorized Inspector.

B) An organization in possession of a valid "R" Certificate of Authorization issued by the National Board, provided the alterations are within the scope of that authorization.

4) Alterations shall be initiated only after they have been authorized by the Authorized Inspector who has reviewed and accepted the alteration methods and calculations. If considered necessary, the Authorized Inspector shall make an inspection of the object before granting authorization.

5) Reports documenting repairs and alterations shall be sent to the Agency in addition to the distribution required by the National Board Inspection Code.

6) Documentation of repairs and alterations shall be in accordance with the National Board Inspection Code, except that, in lieu of a form R-1 or R-2, an alternative form containing equivalent information may be used. All alternative forms shall be signed by the Authorized Inspector. All alternative forms shall be approved by the Agency prior to use. The Authorized Inspector shall determine whether the completion of the form R-1, R-2, or an alternative form is required for routine repairs.

7) Repairs and alterations shall be accepted by either an Authorized Inspector employed by the Authorized Inspection Agency responsible for the boiler or pressure vessel or by an Authorized Inspector employed by the Authorized Inspection Agency of record for the organization making the repair or alteration. It shall be the responsibility of the organization making the repair or alteration to coordinate the acceptance inspection of the repair or alteration.

8) For pressure parts, the rules of Part 3, Section 3 of the National Board Inspection Code shall apply.

9) Pressure Testing

A) The Authorized Inspector may require a pressure test after completing a repair to a boiler or pressure vessel when in the Authorized Inspector's judgment one should be conducted.

B) A pressure test in accordance with the National Board Inspection Code shall be applied to the boiler or pressure vessel on the completion of an alteration.

10) For repair methods, the rules of Part 3 of the National Board Inspection Code shall apply.

11) Alteration methods shall comply with the general requirements of this subsection (a), and with the appropriate ASME Code Section or Part 3 of the National Board Inspection Code, as applicable, including any service restrictions.

12) Major replacement of pressure parts, including drums and shells, that are fabricated by welding and for which a Manufacturers Data Report is required by the applicable ASME Code Section shall be fabricated by a manufacturer having an ASME Certificate of Authorization and the appropriate Certification Mark with appropriate designator. The item shall be inspected, stamped with the applicable Certification Mark with appropriate designator and the word "PART", and reported on the appropriate Manufacturers Partial Data Report.

13) When a repair or alteration requires removal of that part of a non-ISI boiler or pressure vessel containing the Code stamping, the Authorized Inspector shall, subject to the approval of the Agency, witness the making of a facsimile of the stamping, the obliteration of the old stamping and the transfer of the stamping to the new part. When the stamping is on a nameplate, the Authorized Inspector is to witness the transfer of the nameplate to the new part. The Certification Mark with appropriate designator is not to be restamped.

14) For rerating, the rules of this subsection (a) and Part 3 of the National Board Inspection Code shall apply. Additionally, the following shall apply:

A) All requirements in Part 3 of the National Board Inspection Code and this subsection (a) shall be met to the satisfaction of the Authorized Inspection Agency at the location of the installation.

B) Revised calculations verifying the new service conditions shall be required from the original manufacturer or, when the calculations cannot be obtained from this source, they may be prepared by an engineer in accordance with Part 3 of the National Board Inspection Code.

C) The boiler or pressure vessel shall be pressure tested for the rerated condition as required by subsection (a)(9)(B).

15) Nameplates and Stamping for Repair and Alteration

A) The rules of Part 3, Section 5 of the National Board Inspection Code shall apply. The exceptions and clarifications of this subsection (a)(15) shall also apply.

B) For owners that act as the repair organization under the provisions of subsection (a)(1)(A) for repairs or under subsection (a)(3)(A) for alterations who are not in possession of a valid "R" Certificate of Authorization issued by the National Board, the requirements for nameplates and stamping in Part 3, Section 5 of the National Board Inspection Code shall not apply. All other requirements shall be met.

b) Pressure relief valves associated with non-ISI boilers and pressure vessels shall be repaired in accordance with the National Board Inspection Code or with this subsection (b).

1) All pressure relief valves covered by this subsection (b) that are repaired shall be repaired by one of the following organizations:

A) An owner and those organizations under contract to the owner, provided that:

i) the repairs are made in accordance with a Quality Assurance Program that meets the requirements of 10 CFR 50 Appendix B and has been approved by the NRC;

ii) all portions of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (b)(1)(A)(i), that are applicable to a repair activity are applied to the repair; and

iii) the owner notifies the Agency of its intention to apply 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsection (b)(1)(A)(i), to the repair of these pressure relief valves. This notification only needs to be given once for all repairs of pressure relief valves performed under the owner's 10 CFR 50 Appendix B Quality Assurance Program at the nuclear facility.

AGENCY NOTE: The application of the owner's 10 CFR 50 Appendix B Quality Assurance Program, referenced in subsections (b)(1)(A)(i), (ii) and (iii), is subject to review by the Authorized Inspector.

B) The manufacturer of the valve who is in possession of a valid ASME "V", "NV" or "UV" Certificate of Authorization, provided repairs are within the scope of the organization's Certificate of Authorization and are performed under the organization's Quality Control System or Quality Assurance System, as applicable.

C) An organization in possession of a valid "VR" Certificate of Authorization issued by the National Board, provided repairs are within the scope of the organization's Certificate of Authorization and are performed under the organization's Quality Control System.

D) An organization in possession of a valid Certificate of Authorization issued by the Division of Boiler and Pressure Vessel Safety, Office of the State Fire Marshal, to repair pressure relief valves provided repairs are within the scope of the organization's Certificate of Authorization and performed under the organization's accepted Quality Control System.

2) Repair of a pressure relief valve is considered to be the replacement or machining of any critical part, lapping of seat and disc or any other operation that may affect the flow passage, capacity, function or pressure retaining integrity. Disassembly and reassembly or adjustments that affect the pressure relief valve function are not considered a repair, but a test confirming the valve's set pressure shall be performed. The initial installation, testing and adjustments of a new pressure relief valve on a non-ISI boiler or pressure vessel are not considered a repair.

3) Nameplates and Stamping

A) The rules of Part 4, Section 4 of the National Board Inspection Code shall apply. The exceptions and clarifications of this subsection (b)(3) shall also apply.

B) Individuals authorized by the Division of Boiler and Pressure Vessel Safety, Office of the State Fire Marshal, who are properly trained and qualified employees of the owner may make adjustments to the set pressure provided the adjusted settings and the date of the adjustment are recorded on a metal tag secured to the seal wire. All external adjustments shall be resealed showing the identification of the organization making the adjustments.

C) For owners that act as the valve repair organization under the provisions of subsection (b)(1)(A) who are not in possession of a valid "VR" Certificate of Authorization issued by the National Board, the requirements for stamping and nameplates in Part 4, Section 4 of the National Board Inspection Code shall not apply. All other requirements shall be met.

4) Performance Testing

A) The rules of Part 4, Section 4 of the National Board Inspection Code shall apply, regardless of whether the "VR" stamp will be or has been applied. The exceptions and clarifications of this subsection (b)(4) shall also apply.

B) For owners that act as the valve repair organization under the provisions of subsection (b)(1)(A) who are not in possession of a valid "VR" Certificate of Authorization issued by the National Board, performance testing equipment qualified by the owner under Part 4, Section 4 of the National Board Inspection Code shall be done by the owner. The Authorized Inspector shall witness the qualification of test equipment and review the documentation of the qualification.

5) Organizations that repair pressure relief valves under subsections (b)(1)(B) through (b)(1)(D) may perform field repairs in accordance with the following requirements.

A) Qualified technicians in the employ of the repair organization perform the repairs.

B) Procedures that address field repairs are contained in the Quality Control System or Quality Assurance System, as applicable, and are maintained.

C) All functions affecting the quality of the repaired pressure relief valves are controlled from the location for which the appropriate authorization was issued.

D) Periodic audits of work carried out in the field are made by quality control personnel of the repair organization to ensure that the requirements of the Quality Control System or Quality Assurance System, as applicable, are met. This audit may include witnessing the test of the field repaired pressure relief valve.

(Source: Amended at 45 Ill. Reg. 686, effective December 23, 2020)