ASME BPVC.SSC.XI.II.V.IX-2023

Summary of Significant Changes in the 2023 ASME Boiler and Pressure Vessel Code

Section XI
Section II
Section V
Section IX

ASME
SETTING THE STANDARD

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Sections XI, II, V, and IX

The American Society of Mechanical Engineers
Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: April 28, 2023

ASME does not issue written replies to inquiries concerning this publication.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

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FOREWORD

This book is a companion to the 2023 ASME Boiler and Pressure Vessel Code (BPVC). It explains only significant changes to Code requirements that will be published in the 2023 Edition. It covers the following ASME BPVC Sections:

- Section XI, Divisions 1 and 2
- Section II, Parts A, B, C, and D
- Section V
- Section IX

For each of the above Sections, an Introduction describes the historical background, scope of coverage, and commercial application of that Section. The list of changes follows the Introduction. The "Explanation" for each change provides the reason for the action and the value to the Code user. The sequence of the changes follows the order of the Code requirements.

ACKNOWLEDGMENTS

This book is the work of the following ASME Standards and Certification (S&C) staff:

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ASME Press's *Online Companion Guide to the ASME Boiler and Pressure Vessel Codes: Criteria and Commentary on Select Aspects of the Boiler & Pressure Vessel and Piping Codes* (January 2020) provided source material for the Introduction preceding each list of changes. The complete Guide is available in the ASME Digital Collection at https://asmedigitalcollection.asme.org/ebooks/pages/onlinecompanionguide.

ASME gratefully acknowledges the members of the following volunteer committees, who are responsible for development of the ASME Boiler and Pressure Vessel Code Sections noted in this book:

- BPV Committee on Nuclear Inservice Inspection (XI)
- BPV Committee on Materials (II)
- BPV Committee on Nondestructive Examination (V)
- BPV Committee on Welding, Brazing, and Fusing (IX)

SECTION XI

Introduction

DIVISION 1

Section XI, Division 1 of the ASME Boiler and Pressure Vessel Code (BPVC) provides requirements for examination, testing, and inspection of components and systems, and repair/replacement activities in light-water cooled nuclear power plants [e.g., pressurized water reactors (PWRs) and boiling water reactors (BWRs)]. The applicability of Section XI is limited to dealing with degradation detected by periodic inservice inspection and to repair, replacement, and modification activities performed for any reason. Section XI is not applicable to flaws identified at times other than during periodic inservice inspection or repair/replacement activities. Application of Section XI begins when the requirements of the Construction Code have been satisfied. At such time, an item will have passed a specified preservice inspection to serve as a baseline for future inservice inspections. The item will be subject to inservice inspection again after a specified period, which includes specified nondestructive examination. Degradation of the item is evaluated against the flaw acceptance criteria of Section XI to determine if continued operation is acceptable or if repair/replacement activities are necessary to make the item in compliance with the Construction Code again.

Division 1 is divided into Subsections that provide graduated criteria for different Code classes of components, including steel vessels, piping, pumps, valves, and concrete structures. It is the responsibility of the Owner to categorize the Code class of the component and apply the respective Subsection as follows:

– Subsection IWA: General requirements (applicable to all classes of components and supports)
– Subsection IWB: Class 1 components
– Subsection IWC: Class 2 components
– Subsection IWD: Class 3 components
– Subsection IWE: Class MC and CC components
– Subsection IWF: Class 1, 2, 3, and MC component supports
– Subsection IWG: Core Internal structures (in the course of preparation)
– Subsection IWL: Class CC concrete components

Section XI assigns duties to an Authorized Nuclear Inservice Inspector to verify that the responsibilities of the Owner and the mandatory requirements of Section XI are met.

The first publication of Section XI was the 1970 Edition, Rules for Inservice Inspection of Nuclear Reactor Coolant Systems, which only covered rules for inservice inspection of the primary pressure boundary system of nuclear power plants. Section XI was later expanded to contain three Divisions as well as Mandatory and Nonmandatory Appendices. Division 1 provides requirements specifically for light-water cooled nuclear power plants. The former Division 2 covered gas-cooled reactors but was discontinued in 1995. A rewrite of Division 2 was later initiated to provide requirements for the next generation of high-temperature, modular, gas-cooled reactors. Division 2 was published as its own book for the 2019 Edition and is applicable to any reactor design. The former Division 3 covered requirements for liquid-metal-cooled plants but was deleted because it was not widely used by the industry. Section XI previously had testing requirements for pumps, valves, and snubbers in Subsections IWP and IWV, but those were removed in the 1998 Edition (with 2000 Addenda). These requirements are now in ASME OM, Operation and Maintenance of Nuclear Power Plants, and the U.S. Nuclear Regulatory Commission (NRC) references ASME OM for these requirements. Owner responsibilities are identified in IWA-1400 and further detailed elsewhere in Section XI.

Section XI is a voluntary consensus standard that becomes mandatory once it is imposed by law, such as by the applicable regulatory agency depending on the country. The NRC requires the use of certain voluntary consensus standards through incorporation by reference in 10 CFR 50.55a, which is periodically updated to include the latest editions of Section XI. The NRC identifies provisions by which use of Section XI is limited in 10 CFR 50.55a(b)(2). The use of Section XI