

Section XI, Inservice Inspection of Nuclear Power Plants

Course Objectives

This course covers all aspects of Section XI, emphasizing repair, replacement, modification, and maintenance activities; pressure testing; and the relationship between the Code and regulatory and enforcement requirements. The course addresses many controversial issues and topics of current concern and present the broad spectrum of opinions regarding practical application of Code requirements. We will also discuss ways in which you can use recent revisions to Section XI to your advantage. In addition, I will provide you with invaluable insights regarding how other utilities approach some of the more troublesome issues associated with implementation of Section XI requirements, as well as some ways you can use Section XI to save millions of dollars in plant operating costs. We will also discuss many of the technical and political issues surrounding NRC interpretations of the Code, including recent NRC Generic Letters and Information Notices.

As part of the course materials, I use many published ASME Interpretations to explain how the Code requirements can be applied to problems that have confronted other companies. I also use portions of a Reedy Engineering commentary on the Code to highlight significant changes in the Code requirements in the last ten to fifteen years.

The course is designed to provide an introduction to Section XI for people who are not at all familiar with it, as well as to provide, for the experienced Section XI user, an entirely new understanding of some of the many confusing and controversial parts of Section XI. I will leave the student with a much better understanding of the principles and philosophies of Section XI, along with a better understanding of how to maneuver their way through the often confusing cross-references in the Code. The student will be able to find all applicable requirements in Section XI pertaining to any Code activity they are required to perform.

Specific Course Objectives

The student will gain or enhance his/her understanding of the following subjects:

1. Relationship between regulatory and enforcement requirements and ASME Section XI.
 - How NRC regulations mandate use of Section XI.
 - What different alternatives the NRC regulations provide to Section XI.
 - How the NRC accepts or endorses different Editions and Addenda of ASME Codes and Code Cases.
 - How the scope of Section XI and classification of equipment are affected by regulatory requirements.
2. Principles and background of inservice inspection.
 - Determination of inspection intervals.
 - Location of requirements in Section XI for periodic inspection.
 - Basis for sample expansion and increased sampling frequency.
 - The meaning of types, methods, and techniques of nondestructive examination.
3. Requirements for repair, replacement, and modification (RRM).
 - Definitions of RRM terminology.
 - Scope of IWA-4000.
 - Applicability of NPS 1 exemption (or alternative requirements).
 - Requirements for Repair/Replacement Program (and Plans).
 - Need for Suitability Evaluations.
 - How to procure replacement items, including reconciliation of later Editions and Addenda of Construction Codes.
 - What portions of the Construction Code are applicable to a repair/replacement activity.
 - What design requirements are applicable to modifications, evaluations, and rerating.
 - What requirements are applicable to defect removal and examination of welds.
 - When pressure testing is required.
4. Alternatives for evaluation of degraded items.
 - Evaluation of wall thinning.
 - Evaluation of water hammer.
 - Evaluation of overpressurization.
 - Use of weld overlays.
 - Evaluation of leakage (Section XI and Technical Specification requirements).
5. Recent developments in Section XI and new Code Cases
 - Recently-published Section XI Code Cases.
 - Activities currently underway in Subcommittee XI.