

The National Board  
Body of Knowledge  
for the  
**Authorized Nuclear  
Inservice Inspector (ANII)**



SINCE 1919

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\*Denotes Revisions

# The National Board Body of Knowledge for the **Authorized Nuclear Inservice Inspector (ANII)**

The National Board has developed this Body of Knowledge to outline duties and responsibilities for individuals performing inspections during the inservice examination and testing and repair/replacement of nuclear components, parts, systems, and appurtenances in accordance with the *ASME Boiler and Pressure Vessel Code*.

## **Objectives**

An Inspector responsible for inspection of nuclear components, parts, systems, and appurtenances during inservice examination and/or repair/replacement activities should have knowledge, and the ability to apply that knowledge, of the following:

- Code Structure and Content
- Classification of Nuclear Items
- Responsibilities and Duties
- Quality Assurance Programs
- Inservice Inspection Plan Documents
- Repair/Replacement Activities
- Materials and Services
- Welding
- Nondestructive Examination
- Pressure Testing and Heat Treatment
- Calibration of Measurement and Test Equipment
- Radiation Health Physics
- ASME Section XI Certification Requirements
- Record Requirements

## \* **Reference Material**

The following reference material is required to obtain and apply the knowledge of the listed objectives in this Body of Knowledge.

- ASME Section V, *Nondestructive Examination*
- ASME Section IX, *Welding and Brazing Qualifications*
- ASME Section XI, Division 1, *Rules for Inspection and Testing Components of Light-Water-Cooled Plants*
- ASME Section XI, Division 2, *Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities*
- ASME QAI-1, *Qualifications for Authorized Inspection*
- ASME NQA-1, *Quality Assurance Requirements for Nuclear Facility Application*
- ASNT CP-189, *Standard for Qualification and Certification of Nondestructive Testing Personnel*
- RCI-1, NB-263, *Rules for Commissioned Inspectors*

## Body of Knowledge Outline

This outline provides information regarding the listed objectives of this Body of Knowledge, and further describes the duties and responsibilities of the Authorized Nuclear Inservice Inspector (ANII).

### 1. Code Structure and Content

Understanding of *ASME Boiler and Pressure Vessel Code* book structure and ability to locate the appropriate requirements within the code books and related documents.

### 2. Classification of Nuclear Items

Ability to identify nuclear components, parts, and appurtenances.

### 3. Responsibilities and Duties

Understanding of the requirements for:

- Authorized Inspection Agency Personnel
- Plant Owners
- Repair/Replacement Organizations
- Component and Part Manufacturers
- Material Organizations

### 4. Quality Assurance Programs

\* Understanding of quality system elements as defined by:

- Owners
- Certificate Holders
- Repair/Replacement Organizations
- Material Organizations

### 5. Inservice Inspection Plan Documents

Familiarity with the preparation, content, and approval of Inservice Inspection Plan documents, such as:

- Implementation Schedule
- Examination Categories and Items
- Test and Examination Requirements
- Examination Methods
- Percentage of Parts Selected for Examinations
- Disposition of Test Results
- Test Type and Frequency
- Sequence of Successive Examinations

### 6. Repair/Replacement Activities

Ability to verify repair/replacement activities are performed in accordance with the Owner's Repair/Replacement Program requirements, as well as review the Repair/Replacement Program and its implementation.

## 7. Materials and Services

Verify compliance of materials in accordance with applicable code requirements, such as:

- Markings and Permitted Marking Methods
- Material Certifications
- Material Repairs
- \* • Examinations, Tests, and Treatments for Material (Impact Testing and Charpy V-Notch Testing)
- Procurement of Materials and Services

## 8. Welding

Ability to verify compliance with welding requirements of the applicable code, such as:

- Responsibilities
- Permitted Welding Processes
- Procedure Qualification Requirements
- Welder Qualifications Requirements
- Cleaning of Weld Surfaces
- Alignment Tolerances
- Repair of Weld Defects
- Alternative ASME Section XI Welding Techniques

## \* 9. Nondestructive Examination

Ability to verify compliance for nondestructive examination (NDE), such as:

- Examination Requirements, including Preservice
- Fundamentals of Visual, Surface, and Volumetric Methods
- Procedure Qualification Requirements
- Personnel Qualification Requirements
- Reporting Requirements

## \* 10. Pressure Testing and Heat Treatment

Ability to verify compliance and requirements for the following tests and treatments:

- Heat Treatment
- Component Pressure Tests
- System Pressure Tests

## 11. Calibration of Measurement and Test Equipment (M&TE)

\* Understanding of requirements for the calibration of M&TE, such as:

- Calibration Frequencies
- Calibration Methods
- Tolerances
- Master Standards
- Identification
- Records

## 12. Radiation Health Physics

Familiarity and understanding of the following areas:

- Terms and Definitions
- Radiation Types and Characteristics
- Exposure Effects and Limits

\* 13. ASME Section XI Certification Requirements

Familiarity and understanding of the following, as applicable to ASME Section XI:

- Construction Code Stamping and Data Reports
- Owner's Activity Report (OAR-1) Form
- Owner's Repair/Replacement Certification Record (NIS-2) Form

14. Record Requirements

Ability to determine record preservation and transfer requirements in accordance with ASME Section XI.