NRC INSPECTION MANUAL

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INSPECTION MANUAL CHAPTER 1245, APPENDIX C15

CONSTRUCTION INSPECTOR TECHNICAL PROFICIENCY
TRAINING AND QUALIFICATION JOURNAL

Effective Date: 09/14/2026

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INTRODUCTION

The qualification in this appendix, Construction Inspector, contains the technical proficiency requirements for inspectors who perform inspections at all NRC regulated facilities under construction. The intent is to qualify the inspector to perform construction-related inspections at NRC regulated facilities, up to and including pre-operational testing. It is not intended to qualify inspectors to perform operational inspections, such as start-up testing. Additional NRC inspector qualification or equivalent inspector experience should be considered prior to inspectors performing operational inspections, such as start-up testing.

General Guidance

- You are responsible for keeping track of what tasks you have completed. Complete all parts of each activity.
- Do not begin the activities or complete the courses in this qualification journal until you have completed the Basic Inspector Certification Journal contained in Appendix A.
- You may complete the General Proficiency requirements contained in Appendix B concurrently with the Technical Proficiency requirements outlined in this journal.
- Your supervisor will act as a resource as you complete each activity. Discuss any questions you may have about how a task must be done or how the guidance is applied. Your supervisor may also designate other fully qualified inspectors to work with you as you complete the various activities.
- Work with your supervisor to determine what on-the-job training activities are relevant to your position and applicable to your work. Typically, either OJT 1 and 2 are completed or OJT 3 and 4 are completed, depending on trainee's role.

Required Construction Inspector Training Courses

These courses can be taken in any order:

- Power Plant Engineering (E-110) (course or self-study)
- Reactor Technology overview (104 P or B)
- Advance Technology Differences Course (R107 P)
- F-201 or F-201S: Fuel Cycle Processes
- Quality Assurance Course, as designated by Supervisor (e.g., external training). Note only one course is necessary. See following for options to complete
  - Electric Power Research Institute (EPRI) Nuclear Utility Procurement Training Course, or another course similar to previous NRC course E-301 "Quality Assurance Program Training.")
  - QA Requirements online course (https://www.asme.org/learning-development/find-course/nqa-1-part-1-18-qa-requirements/online)
  - ASME Practical online course (https://www.asme.org/learning-development/find-course/nqa-1-practical-application/online)

Construction Inspector Individual Study Activities

(ISA-CON-1) Title 10 “Energy,” of the Code of Federal Regulations

PURPOSE:

The purpose of this activity is to familiarize you with the contents of Chapter 1 of Title 10 of the *Code of Federal Regulations* (CFR). This activity will provide you with a working knowledge of the contents of Title 10, Parts 1 through 199, and an understanding of the broad spectrum of requirements associated with your inspection activities.

The CFR is a codification of the rules published in the *Federal Register* by the executive departments and agencies of the Federal Government. Title 10 represents the broad area of energy, and Chapter 1, Parts 1 through 199, pertain to the U.S. Nuclear Regulatory Commission (NRC), an independent agency established by the Congress of the United States under the Energy Reorganization Act of 1974. NRC rules and regulations are established to ensure adequate protection of public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States.

COMPETENCY AREAS: INSPECTION
REGULATORY FRAMEWORK

LEVEL OF EFFORT: 40 hours

REFERENCES:

- Chapter 1, Parts 1 through 199, of the *Code of Federal Regulations*
- Energy Reorganization Act of 1974

EVALUATION CRITERIA:

At the completion of this activity, you should be able to do the following:

1. Discuss the broad requirements and significance of the following parts of Title 10 of the *Code of Federal Regulations*. You should develop a general sense of what the requirements are and where the following requirements are located:

    a. 10 CFR Part 25, “Access Authorization for Licensee Personnel”

    b. 10 CFR Part 26, “Fitness for Duty Programs” with emphasis on the difference between construction and operating reactors

    c. 10 CFR Part 40, “Domestic Licensing of Source Material”

    d. 10 CFR Part 70, “Domestic Licensing of Special Nuclear Material”

    e. 10 CFR Part 73, “Physical Protection of Plants and Materials” with emphasis on the difference between construction and operating reactors

f. 10 CFR Part 100, “Reactor Site Criteria”

2. Discuss the broad requirements and significance of 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” especially the following appendices:

   a. Appendix C, “Combined Licenses”

   b. Appendix D, “Design Certification Rule for the AP1000 Design”

   c. Appendix H, “Enforcement”

3. Discuss the broad requirements and significance of 10 CFR Part 53, “Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors.”

4. Discuss the broad requirements and significance of 10 CFR Part 50.34 “Contents of Applications; Technical Information.”

TASKS:

1. Perform a detailed review of the 10 CFR parts listed above and perform a broad overview of 10 CFR Parts 1-199. Understand key items, including any differences between construction and operating facilities.

2. Review several enforcement actions issued to licensees with respect to the various Title 10 Parts. These can be found by using Operating Experience SharePoint Hub, located at this URL: https://usnrc.sharepoint.com/teams/NRR-Operating-Experience-Branch/OpE%20Hub/index.aspx (non-public) or by searching inspection reports on the NRC public web page. Discuss compliance issues with various Parts of Title 10 with senior inspectors, senior project engineers, or senior residents.

3. Meet with your supervisor, or a qualified operations inspector, to demonstrate your understanding of the evaluation criteria.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-1

(ISA-CON-2) Overview of 10 CFR Part 21, “Reporting of Defects and Noncompliance”

PURPOSE:

The purpose of this activity is to familiarize you with 10 CFR Part 21 “Reporting of Defects and Noncompliance.” These regulations require notification to the NRC of defects by suppliers of basic components. This individual study activity will help you understand the purpose of 10 CFR Part 21 and provide you with some basic knowledge that NRC inspectors will use when conducting construction inspections.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 20 hours

REFERENCES:

- 10 CFR Part 21, “Reporting of Defects and Noncompliance”
- Issued Part 21 Reports (can be found on the NRC Public Website: Home > NRC Library > Document Collections > Events, Reports > Part 21 Reports)
- Generic Letter (GL) 89-02, “Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products”
- GL 91-05, “Licensee Commercial-Grade Procurement and Dedication Programs”
- Inspection Procedure (IP) 43004, “Inspection of Commercial-Grade Dedication Programs”
- Regulatory Guide 1.164, “Dedication of Commercial-Grade Items for Use in Nuclear Power Plants”
- Vendor Workshop on Commercial-Grade Dedication (can be found on the NRC Public Website: Home > Nuclear Reactors > New Reactors > How We Regulate > Regulatory Oversight > Quality Assurance for New Reactors > Workshops on Vendor Oversight > 2008)

EVALUATION CRITERIA:

Upon completion of this activity, you will be asked to demonstrate your general understanding of 10 CFR Part 21 and why these regulations are important by successfully addressing the following:

1. Describe the general purpose of 10 CFR Part 21.
2. Discuss the basis for the applicability of 10 CFR Part 21 to applicants, licensees, vendors and suppliers.

3. Define a defect in the context of 10 CFR Part 21.

4. Identify what 10 CFR Part 21 requires to be reported. Describe the notification requirements of 10 CFR 50.55(e) and explain the relationship of this part to 10 CFR Part 50 and Part 21.

5. Discuss the definitions of basic component, commercial grade item, critical characteristics, and dedication.

6. Describe the process of selecting critical characteristics and how 10 CFR Part 50, Appendix B relates to the process.

7. Describe the different methods for acceptance of commercial-grade items, any restrictions on use of these methods, and how 10 CFR Part 50, Appendix B relates to the acceptance methods.

8. Discuss why it is important for every NRC inspector to have a general understanding of 10 CFR Part 21

9. Discuss Enforcement Actions to be taken for 10 CFR Part 21 issues discovered by an inspector

TASKS:

1. Review 10 CFR Part 21 for a general understanding of the following:

   a. The purpose of 10 CFR Part 21 [21.1]
   b. The meaning of commercial grade item dedication [21.3]
   c. The relationship of 10 CFR Part 21 to Part 50.55(e) [21.2(b)]
   d. Documents that are required to be posted [21.6]
   e. Requirements for reporting defects [21.21(d)(4)]

2. Locate and review issued 10 CFR Part 21 reports. Discuss experiences with senior inspectors and residents.

3. Meet with your supervisor or the person designated to be your resource for this activity and discuss the items listed in the Evaluation Criteria section.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-2.

(ISA-CON-3) Power Reactor Construction Design Control

PURPOSE:

The purpose of this activity is to understand licensing and construction of new power reactors licensed under 10 CFR Part 50, 10 CFR Part 52, and 10 CFR Part 53. For power reactors licensed under 10 CFR Part 50, the NRC uses a two-step process. A construction permit (CP), including a Preliminary Safety Analysis Report (PSAR), is approved for construction, then an operating licensee (OL), including a Final Safety Analysis Report (FSAR) is approved when the plant is substantially complete.

For power reactors licensed under 10 CFR Part 52, a combined operating license is issued, which allows the plant to be built and then operated after all inspections, tests, analysis, and acceptance criteria (ITAAC) are complete. COLs reference a standard design approval (SDA) or a standard design certification, commonly referred to as a "certified design."

For power reactors licensed under 10 CFR Part 53, licensees can choose either a two-step process with a CP and an OL, or a one step process similar to the 10 CFR Part 52 process.

A design control document (DCD) is the portion of a certified design that contains the technical information about the design. Typically, the information needed to certify a design includes the principal plant systems and components and their corresponding ITAAC. In addition to the detailed design information, the applicant also provides information about the site parameters (e.g., the postulated physical, environmental, and demographic features of an assumed site) for a plant and other system interfaces that will be needed to support the safe operation of the reactor.

The requirements for design control during construction of a reactor plant differ depending on the licensing pathway used for the plant. Construction inspectors must understand the licensing basis of the reactor plant during inspection and apply the appropriate design control standards.

COMPETENCY AREAS: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 24 hours

REFERENCES:

- 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants"
- 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"
- 10 CFR Part 53, "Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors
- NUREG-0800, "Standard Review Plan"

- DNRL-ISG-2022-01, “Interim Staff Guidance Safety Review of Light-Water Power Reactor Construction Permit Applications.

- DANU-ISG-2022-01, “Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications—Roadmap”

EVALUATION CRITERIA:

At the conclusion of this activity, the inspector should be able to:

1. Explain the difference between the 10 CFR Part 50, 10 CFR Part 52, and 10 CFR Part 53 licensing processes for constructing power reactor plants.

2. Define the following terms:

   a. Construction (per 10 CFR Part 50.10)
   b. Construction Permit (CP)
   c. Combined Operating License (COL)
   d. Limited Work Authorization (LWA)
   e. Manufacturing License (ML)
   f. Preliminary Safety Analysis Report (PSAR)
   g. Final Safety Analysis Report (FSAR)
   h. License Amendment Request (LAR)
   i. License Exemption
   j. Design Control Document (DCD)
   k. Tier 1 information
   l. Tier 2 information
   m. Tier 2* information
   n. Inspections, tests, analysis, and acceptance criteria (ITAAC)
   o. Design Acceptance Criteria (DAC)

3. Explain the difference between a PSAR, an FSAR, and a DCD. Include a discussion of when and how a CP or COL holder may make changes to their PSAR or FSAR.

4. Explain the relationship between Tier 1 and Tier 2 information in a DCD.

5. Explain how license amendments and license exemptions are used for the different licensing pathways.

6. Locate the ITAAC information and tables in a DCD.

7. Identify the kind of information available in a PSAR or the Tier 2 section of the DCD.

8. Discuss why DAC were used as part of the design certification and demonstrate an understanding of the practical application of DAC.

TASKS:

1. Read the definitions of the terms in the evaluation criterion 2. Develop an understanding of when the different permits and licenses may be used and some advantages and disadvantages of each (e.g., CP, COL, ML, and LWA).

2. Locate a recently approved CP, COL, ML, and LWA. Review the organization and general content of each.

3. Review the content, format, and presentation of ITAAC in a DCD.

4. Read the description of DAC in Chapter 14.3 of NUREG-0800, the Standard Review Plan.

5. Meet with your supervisor, mentor, or a qualified construction inspector to discuss any questions you may have as a result of this activity. Discuss the answers to the questions listed under the Evaluation Criteria section of this study guide with your supervisor.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-3.

(ISA-CON-4) Significance of Construction Inspection Findings

PURPOSE:

The purpose of this activity is to familiarize you with the process of determining the significance of construction inspection findings. This ISA builds on previous qualification requirements contained in IMC 1245, Appendix A, ISA 7 "The Enforcement Program."

Significance or severity level determination uses risk insights, where appropriate, to help NRC inspectors and staff determine the safety or security significance of construction inspection findings. The ARCOP significance determination process (SDP) is used for power reactor construction inspection findings. The SDP is a risk-informed process, and the resulting safety significance of findings is used to define a licensee's level of safety performance in constructing the facility and to define the level of NRC engagement with the licensee. The ARCOP SDP supports the cornerstones that are associated with the strategic performance areas as defined in IMC 2570, "Advanced Reactor Construction Oversight Program Basis Document." The SDP determinations for power reactor construction inspection findings are used in assessing licensee performance in accordance with guidance provided in IMC 2572, "Assessment of Advanced Reactor Construction Projects."

For other construction inspection programs (i.e., NPUF and fuel facilities), the NRC uses the guidance in the NRC Enforcement Policy and the NRC Enforcement Manual to determine the severity level of traditionally enforced construction inspection findings. Traditional enforcement construction inspection findings are used similarly to SDP-evaluated findings in the assessment process.

COMPETENCY AREAS: INSPECTION
TECHNICAL AREA EXPERTISE
REGULATORY FRAMEWORK

LEVEL OF EFFORT: 16 hours

REFERENCES:

- IMC 2571, "Dispositioning Advanced Power Reactor Construction Noncompliances"
- IMC 2570, "Advanced Reactor Construction Oversight Program Basis Document"
- IMC 2550, "Non-Power Production and Utilization Facilities (NPUFs) Licensed Under 10 CFR Part 50: Construction Inspection Program (CIP)"
- IMC 2606, Assessment of the Risk Resulting from a Potential Safety Noncompliance at a Fuel Cycle Facility

EVALUATION CRITERIA:

At the completion of this activity, you should be able to do the following:

1. Explain the methodology for determining the significance or severity level of the different types of construction inspection findings.

2. Describe and discuss the five Advanced Reactor Construction Oversight Program (ARCOP) cornerstones and three strategic performance areas of construction.

3. Define the safety significance and give examples of Green, White, and Yellow ARCOP findings.

4. Explain how Construction findings are assessed using the ARCOP Finding Response Table in IMC 2572. Explain when findings would be processed using Attachment 5 of IMC 2571.

5. Discuss the Enforcement Review Panel and the inspector's role during the Enforcement Review Panel as described in the NRC Enforcement Manual.

6. Discuss the "Process for Appealing NRC Characterization of Inspection Findings (SDP appeal process)" as described in IMC-2571

TASKS:

1. Read IMC 2571 and develop an understanding of how to disposition ARCOP noncompliances.

2. Go to the Advanced Reactor Construction Oversight Program (ARCOP) Web site. Review the individual plant performance summaries for a sample of findings in each of the ARCOP cornerstones (if samples of each safety significance are posted).

3. Using a previous construction inspection finding, process the finding using the process described in IMC 2571. Discuss your results with your supervisor or a qualified inspector, specifically discussing the methodology used to determine the following:

    a. Performance deficiency

    b. If the performance deficiency is more than minor

    c. If the issue is Green or if an Enforcement Review Panel is required. Be able to justify your determination.

    d. Compare your conclusion with those given in the actual finding.

4. Whenever possible, attend an Enforcement Review Panel. If you are unable to attend an Enforcement Review Panel, review the Enforcement Manual and an actual Enforcement Review Panel package to develop an understanding of the Enforcement Review Panel purpose, process, and the contents of the Enforcement Review Panel package. Discuss the rationale for the outcome/resolution of the panel with a qualified inspector.

5. Watch the ARCOP Training recordings (ARCOP training Part I, general ARCOP information Feb 9 2026.mp4) and (ARCOP training Part II, construction inspectors Feb 10 2026.mp4) (non-public)

6. Meet with your supervisor or a qualified inspector to discuss any questions you may have about this training activity.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-4.

(ISA-CON-5) Fuel Cycle Process Fundamentals

PURPOSE:

The purpose of this activity is to provide a basic overview of the nuclear fuel cycle. This individual study activity will help you to understand the common processes of the nuclear fuel cycle.

COMPETENCY AREAS: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 16 hours

REFERENCES:

- Fuel Cycle Process (F-201S) Self Study Course
- (F-201S) Module 1.0
- (F-201S) Module 4.0, Learning Objective 4.1.4
- (F-201S) Module 4.0, Learning Objective 4.1.5
- (F-201S) Module 4.0, Learning Objective 4.1.6
- (F-201S) Module 5.0, Learning Objective 5.1.1
- (F-201S) Module 5.0, Learning Objective 5.1.10

EVALUATION CRITERIA:

Upon completion of this activity, you will be asked to demonstrate your general understanding of the commercial nuclear fuel cycle applications of nuclear energy, by successfully discussing the following concepts:

1. Discuss in general the nuclear fuel cycle as described in Module 1.0.
2. What isotope of uranium is preferred for enrichment and why?
3. Describe basic steps of the gas centrifuge uranium enrichment process.
4. Refer to the reference material and discuss the hazards of UF_6 and the gas centrifuge enrichment operation.
5. Refer to the reference material and describe the basic steps of the laser-based uranium enrichment processes (AVLIS, MLIS, and SILEX).
6. Refer to the reference material and discuss the hazards of the laser based enrichment processes.
7. Discuss the meaning of Items Relied On For Safety (IROFS) as related to fuel fabrication facilities.
8. Discuss why the NRC regulates fuel fabrication facilities.

9. Describe mixed oxide (MOX) fuel and its purpose.
10. What are the intended products of the MOX Fuel Fabrication Facility (MFFF)?
11. What is the current intent of the MOX program?
12. What facility/country is the United States MFFF based upon and where is it being built?

TASKS:

Option 1: Review the references material to gain an understanding of the principles discussed in the evaluation material; review and discuss the evaluation criteria with your supervisor, mentor, or a qualified construction inspector.

Option 2: Complete the Fuel Cycle Process (F-201) course or self-study course (F201S).

DOCUMENTATION: General Proficiency Certification Signature Card, Item ISA-CON-5

Or

General Proficiency Certification Signature Card Item Training Course F-201/F201S: Fuel Cycle Process/Directed Self Study

(ISA-CON-6) Fuel and Non-Power Producing Facilities

PURPOSE:

The purpose of this activity is to provide a basic understanding of the Construction Inspection Program (CIP) for fuel facilities and non-power production and utilization facilities (NPUFs) under 10 CFR Parts 30, 40, 50, and 70.

The fuel facility and NPUF CIPs apply to all safety-related (NPUF) or items relied on for safety (IROFS, for fuel facilities) construction activities, including, design, procurement, fabrication, construction, pre-operational testing activities, and development of programs required for operation. Implementation of IMCs 2630, 2696, and 2550 will begin at NRC issuance of the Construction Permit and will continue through completion of construction. The IMCs implementing this CIP will provide reasonable assurance that the design and construction of fuel facilities and NPUFs have been completed in accordance with applicable regulations, license requirements, and commitments.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 16 hours

REFERENCES:

- IMC 2630, “Mixed Oxide Fuel Fabrication Facility Construction Inspection Program”
- IMC 2696, “Louisiana Energy Services Gas Centrifuge Facility Construction and Pre-Operational Readiness Review Inspection Programs”
- IMC 2550, “Non-Power Production and Utilization Facilities (NPUFs) Licensed under 10 CFR Part 50: Construction Inspection Program (CIP)”
- 10 CFR Part 30, Rules of General Applicability to Domestic Licensing of Byproduct Material
- 10 CFR Part 40, Domestic Licensing of Source Material
- 10 CFR Part 50, Domestic Licensing of Production and Utilization Facilities
- 10 CFR Part 70, Domestic Licensing of Special Nuclear Material

EVALUATION CRITERIA:

Upon completion of the tasks, you should be able to demonstrate your general understanding of the fuel facilities and NPUFs, by discussing the following topics:

1. Describe the importance and purpose of the following types of facilities:

    a. Fuel Fabrication Facility
    b. Enrichment Facilities (e.g., Gas Centrifuge Facility)
    c. Radioisotope Production Facility
    d. Research and Test Reactor

2. Discuss which parts of 10 CFR apply to fuel facilities and NPUFs during construction.

3. Describe the CIPs as specified below:

    a. Discuss how the fuel facility construction inspection program requirements verify that the construction of the principal systems, structures, and components (PSSCs) and IROFS have been completed in accordance with the construction authorization and license application (including the safety analysis report (SAR), the integrated safety analysis (ISA), the ISA summary (ISAS), and the safety evaluation report (SER)) to possess and use special nuclear material.

    b. Discuss how the NPUF construction inspection program requirements verify that the construction of safety-related systems, structures, and components (SSCs) have been completed in accordance with the construction permit (CP), including the preliminary safety analysis report (PSAR), the final safety analysis report (FSAR), and the SER.

TASKS:

1. Locate and review the listed references to understand the importance, purpose, and construction inspection programs of fuel facilities and NPUFs.

2. For the following types of facilities, understand which parts of 10 apply during construction.

    a. Fuel Fabrication Facility
    b. Gas Centrifuge Facility
    c. Radioisotope Production Facility
    d. Research and Test Reactor

3. After researching online, or talking to a cognizant branch chief or inspector, be able to describe medical radioisotopes and the importance of radioisotope production facilities.

4. Meet with your supervisor or a qualified construction inspector to discuss any questions that you may have as a result of these activities and demonstrate that you can meet the evaluation criteria.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-6.

(ISA-CON-7) Industry Codes & Standards

PURPOSE:

The purpose of this activity is to introduce you to some of the basic Codes, NRC Regulatory Guides (RG) and associated industry standards commonly used during construction activities. The list is not inclusive but it does contain the major documents that will be utilized during construction and fabrication.

COMPETENCY AREAS: INSPECTION

LEVEL OF EFFORT: 40 hours

REFERENCES:

See the attached list of References for ISA-CON-7

EVALUATION CRITERIA:

At the completion of this activity, and as determined by the supervisor, inspectors should be able to:

1. Identify the general codes commonly used by construction inspectors and discuss the topics included in these codes.

2. Discuss the relationship between RGs (guidelines) and industry standards (accepted methodologies).

3. Identify the RG and associated industry standards that address the 10 CFR Part 50, Appendix B, Quality Assurance (QA) Criteria. Discuss the topics included in the RG and industry standards associated with each.

TASKS:

1. For the appropriate technical area, locate and review each of the documents listed in the attached list of references.

2. When available, complete NRC or SF-182 equivalent training related to relevant Industry Codes and Standards. This is a post qualification requirement and not a prerequisite to completing this ISA.

3. Meet with your supervisor, mentor, or a qualified construction inspector to discuss any questions you may have as a result of this activity. Discuss the answers to the questions listed under the Evaluation Criteria section of this study guide with your supervisor.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-7.

References for ISA-CON-7 " Industry Codes and Standards"

General

10 CFR Part 50	Appendix A, General Design Criteria for Nuclear Power Plants
10 CFR 50.46	Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors
10 CFR 50.49	Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants
10 CFR 50.55a	Codes and Standards

The American Society for Mechanical Engineers (ASME)

Boiler & Pressure Vessel Code

Section II	Materials
Section III	Nuclear
Section V	Nondestructive Examination
Section VIII	Pressure Vessels
Section IX	Welding and Brazing Qualifications
Section XI	Inservice Inspection

Civil/Structural

American Concrete Institute (ACI)

ACI 117	Tolerances for Concrete Construction and Materials
ACI 214	Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 301	Specifications for Structural Concrete
ACI 304	Measuring, Mixing, Transporting and Placing Concrete
ACI 305	Hot Weather Concreting
ACI 306	Cold Weather Concreting
ACI 304	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 308	Curing Concrete
ACI 309	Consolidation of Concrete
ACI 311	Recommended Practice for Concrete Inspection
ACI 318	Building Code Requirements for Reinforced Concrete
ACI 349-01	Code Requirements for Nuclear Safety Related Concrete Structures
ACI SP-2	Manual of Concrete Inspection

American Institute of Steel Construction (AISC)

M011	Manual of Steel Construction
S326	Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings
S329	Specification for Structural Joints Using ASTM A325 or A490 Bolts

American National Standards Institute (ANSI)

N45.2.5	Supplemental QA Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel

American Society for Testing and Materials (ASTM)

A 36	Specification for Structural Steel
A 325	Specification for High-Strength Bolts for Structural Steel Joints
A 490	Specification for Heat Treated, Steel Structural Bolts, 150 ksi Tensile Strength
C 29	Unit Weight and Voids in Aggregates
C 94	Specifications for Ready-Mixed Concrete
C 172	Method of Sampling Freshly Mixed Concrete
C 1077	Practice for Laboratories Testing concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
D 422	Method for Particle-Size Analysis of Soils
D 1556	Test Method for Density of Soil in Place by the Sand-Cone Method
D 2167	Test Method for Density and Unit Weight of Soil In-Place by the Rubber Balloon Method
D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods
D 3017	Moisture Content of Soil and soil Aggregate in Place by Nuclear Methods
D 3740	Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
E 329	Evaluation of Testing and Inspection Agencies

American Welding Society (AWS)

AWS DI.1	Structural Welding Code - Steel
AWS B2.1	Specification for Welding Procedure and Performance Qualification

The International Organization for Standardization (ISO)

ISO 14731	Welding Coordination - Tasks and Responsibilities

Nuclear Regulatory Commission Regulatory Guides (RG)

RG 1.107	Qualifications for Cement Grouting for Prestressing Tendons in Containment Structures
RG 1.127	Inspection of Water-Control Structures Associated with Nuclear Power Plants
RG 1.132	Site Investigations for Foundations of Nuclear Power Plants
RG 1.136	Materials, Construction, and Testing of Concrete Containments (Articles CC-1000, -2000, and -4000 through -6000 of the Code for Concrete Reactor Vessels and Containments)
RG 1.138	Laboratory Investigations of Soils for Engineering Analysis and Design of Nuclear Power Plants
RG 1.142	Safety Related Concrete Structures for Nuclear Power Plants

Concrete Reinforcing Steel Institute (CRSI)

MSP-1	Manual of Standard Practice

Portland Cement Association (PCA)

EB001	Design and Control of Concrete Mixtures

Mechanical

American Society of Mechanical Engineers (ASME)
Boiler & Pressure Vessel Code

Section III, Division 1	Nuclear Power Plant Components
Section III, Division 2	Concrete Reactor Vessels and Containments

Nuclear Regulatory Commission Regulatory Guides (RG)

RG 1.27	Ultimate Heat Sink for Nuclear Power Plants
RG 1.31	Control of Ferrite Content in Stainless Steel Weld Metal
RG 1.43	Control of Stainless Steel Weld Cladding of Low-Alloy Steel Components
RG 1.44	Control of the Use of Sensitized Stainless Steel
RG 1.50	Control of Preheat Temperature for Welding of Low-Alloy Steel
RG 1.54	Service Level I, II, and III Protective Coatings Applied to Nuclear Power Plants
RG 1.71	Welder Qualification for Areas of Limited Accessibility
RG 1.84	ASME Code Case Applicability
RG 1.87	Guidance for Construction of Class 1 Components in Elevated-Temperature Reactors (Supplement to ASME Section III Code Cases 1592, 1593, 1594, 1595, and 1596)
RG 1.96	Design of Main Steam Isolation Valve Leakage Control Systems for Boiling Water Reactor Nuclear Power Plants
RG 1.100	Seismic Qualification of Electrical and Mechanical Equipment for Nuclear Power Plants
RG 1.116	QA Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems
RG 1.150	Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations

Electrical

Institute of Electrical and Electronics Engineers (IEEE)

315	Graphic Symbols for Electrical and Electronics Diagrams
336	Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities
338	IEEE Standard Criteria for Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems
603	Criteria for Safety Systems for Nuclear Power Generating Stations
7-4.3.2	Standard Criteria for Digital Computers in Safety Systems
828	Standard for Software Configuration Management Plans
829	Standard for Software Test Documentation
830	Standard for Software Requirements Specification
1012	Standard for Software Verification and Validation
1028	Standard for Software Reviews and Audits
1074	Standard for Developing Software Lifecycle Processes
1050	Guide for Instrument and Control Equipment Grounding in Generating Stations

Nuclear Regulatory Commission Regulatory Guides (RG)

RG 1.6	Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems
RG 1.11	Instrument Lines Penetrating Primary Containment
RG 1.30	Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment (ANSI N45.2.4/IEEE 336)
RG 1.32	Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants (IEEE 308)
RG 1.40	Qualification Tests of Continuous-Duty Motors Installed Inside the Containment of Water-Cooled Nuclear Power Plants (IEEE 334)
RG 1.47	Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems
RG 1.53	Application of the Single-Failure Criterion to Nuclear Power Plant Protection Systems (IEEE 279 and IEEE 379)
RG 1.63	Electric Penetration Assemblies in Containment Structures for Nuclear Power Plants (IEEE 317)
RG 1.73	Qualification Tests of Electric Valve Operators Installed Inside the Containment of Nuclear Power Plants
RG 1.75	Physical Independence of Electric Systems (IEEE 384)
RG 1.81	Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants
RG 1.89	Qualification of Class 1E Equipment for Nuclear Power Plants (IEEE 323)
RG 1.97	Criteria For accident Monitoring Instrumentation for Nuclear Power Plants
RG 1.100	Seismic Qualification of Electrical and Mechanical Equipment for Nuclear Power Plants
RG 1.105	Instrument Set points (ISA S67.04)
RG 1.106	Thermal Overload Protection for Electric Motors on Motor-Operated Valves
RG 1.118	Periodic Testing of Electrical Power and Protection Systems
RG 1.128	Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants (IEEE 484)
RG 1.129	Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants (IEEE 450)
RG 1.131	Qualification Tests of Electric Cables, Field Splices, and Connections for Light-Water-Cooled Nuclear Power Plants (IEEE 383)
RG 1.151	Instrument Sensing Lines (ISA S67.02)
RG 1.152	Criteria for Programmable Digital computer System Software in Safety Systems
RG 1.168	Verification, Reviews and Audits for Digital Computer Software used in Safety Systems
RG 1.169	Configuration Management Plans for Digital Software Used in Safety Systems
RG 1.170	Software Test Documentation for Digital Computer Software used in Safety Systems
RG 1.171	Software Unit Testing for Digital Computer Systems
RG 1.172	Software Requirements Specifications for Digital Computer Software
RG 1.173	Developing Software Life Cycle Processes for Digital Computer Software
RG 1.180	Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems

Testing

Nuclear Regulatory Commission Regulatory Guides (RG)

RG 1.68	Initial Test Programs for Water-Cooled Nuclear Power Plants
RG 1.79	Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors

(ISA-CON-8) Construction and Preoperational Testing

PURPOSE:

The purpose of this activity is to provide a basic overview of the purpose and the inspection requirements for construction and preoperational testing. This individual study activity will help you to understand and inspect activities relating to construction and preoperational testing.

COMPETENCY AREAS: INSPECTION

LEVEL OF EFFORT: 32 hours

REFERENCES:

- 10 CFR Part 50, Domestic Licensing of Production and Utilization Facilities, 10 CFR 50.34(b)(6)(iii)
- 10 CFR Part 52, Licenses, Certifications, and Approvals for Nuclear Power Plants; 10 CFR 52.79(a)(28)
- 10 CFR Part 53, Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors; 53.620(b)(3), 53.1309(a)(2)(iii), 53.1369(z), and 53.1416(c)
- 10 CFR Part 70, Domestic Licensing of Special Nuclear Material; 10 CFR 70.64(a)(8)
- DG-1431, Applications for Commercial Nuclear Plants Under 10 CFR PART 53
- RG 1.68, Initial Test Programs for Water-Cooled Nuclear Power Plant
- DANU-ISG-2022-06, Advanced Reactor Content of Application Project Chapter 12 - Post-construction Inspection, Testing, and Analysis Program

EVALUATION CRITERIA:

Upon completion of this activity, you will be asked to demonstrate your general understanding of construction, preoperational, and startup testing by successfully discussing the following concepts:

1. What is the purpose of the NRC inspecting construction and preoperational testing (what is the basis for the testing and what is the NRC there to do)?
2. Explain the difference between construction, preoperational and startup testing and when each is performed.
3. Where do you find requirements for preoperational testing, including prerequisites, test methods, and acceptance criteria (for both 10 CFR Part 50 and Part 52 testing)?

4. How do you prepare for a construction or preoperational testing inspection (generic items such as familiarization with the inspection procedures (IPs), licensee's test procedure(s), licensee's test conduct procedures, awareness of plant conditions, etc.)?

5. Describe what you look for when reviewing test procedure specifications and attributes prior to and during testing.

6. Explain how operating and testing experience is used during the test program. Explain the steps you would use to find operating experience for a part, component, or system you are inspecting.

7. Explain the following attributes in performing a Main Control Room (MCR) inspection

    a. what to look for (system response AND personnel response),

    b. how/when to ask questions, intervene, observe process, etc.

8. Explain the following attributes in performing field inspections:

    a. what to look for (system response AND personnel response) for each type of component (valve, supports, cabinets, pumps, etc.),

    b. how/when to ask questions, intervene

    c. safety during observations of testing

9. Explain what an inspector would do with data/discrepancies, including:

    a. Difference between observation of the data collection process and the acceptance criteria

    b. corrective action process for test deficiencies

    c. when/if to intervene

10. Explain which 10 CFR Part 50, Appendix B Criteria would specifically apply to the pre-operational testing?

TASKS:

1. Locate and read the following documents, specifically the chapters and sections related to testing during the different construction phases and the differences between licensee facilities:

    a. 10 CFR Part 50, Appendix A, General Design Criteria (GDC)

    b. 10 CFR Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

    c. Licensee PSAR or FSAR Chapter 14, Initial Test Program (LWR), or Chapter 12, Post-construction Inspection, Testing, and Analysis Program (non-LWR)

d. NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition, Chapter 14, Initial Test Program and ITAAC-Design Certification”

e. NUREG-1520, “Standard Review Plan for Fuel Cycle Facilities License Applications,” Sections 2.4.3, “Regulatory Acceptance Criteria; and 11.4.3.2, “Maintenance”

f. RG 1.68, “Initial Test Programs for Water-Cooled Nuclear Power Plant”

g. DANU-ISG-2022-06, Advanced Reactor Content of Application Project Chapter 12 - Post-construction Inspection, Testing, and Analysis Program

2. Read the sections of the following IMCs and Inspection Procedures (IPs) that describe testing. Be familiar with testing during the different phases of construction and at the different types of licensee facilities:

   a. IMC 2514, AP 1000 Reactor Inspection Program - Startup Testing Phase

   b. IMC 2515, Light-Water Reactor Inspection Program-Operations Phase

   c. IMC 2550, Non-Power Production Facilities (NPUFs) Licensed Under 10 CFR Part 50 : Construction Inspection Program (CIP)

   d. IMC 2696, Louisiana Energy Services Gas Centrifuge Facility Construction and Pre-Operational Readiness Review Inspection Programs

   e. IMC 2573, Inspection of the Advanced Reactor “Quality of Reactor Plant Construction” Strategic Performance Area

   f. IMC 2574, Inspection of the Advanced Reactor “Operational Readiness” Strategic Performance Area

3. Using ADAMS and Operating Experience SharePoint Hub, search for construction-related operating experience. Determine how such information could be used in preparing and executing an inspection.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item ISA-CON-8.

Constructor Inspector On-the-Job Activities

(OJT-CON-1) Construction Inspection Accompaniment

PURPOSE:

The purpose of this activity is to familiarize you with a typical construction inspection for a nuclear facility. This OJT is written assuming the inspection will be conducted at an advanced power reactor construction site. However, this OJT may also be conducted at a fuel facility or NPUF under construction. If performed at a fuel facility or NPUF, then substitute the appropriate references (IMCs, IPs etc.) below.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 40 hours

REFERENCES:

- Applicable Final Safety Analysis Report Sections
- Applicable Inspection Procedures
- IMCs 2570, 2571, 2572, 2573, 2574, and 0618
- ITAAC (as applicable)

EVALUATION CRITERIA:

Upon completion of the tasks, you should be able to:

1. State the actions required to be taken to plan and perform a construction inspection.
2. Identify licensee activities that will occur throughout the performance of a designated construction inspection.
3. Discuss the results of the inspection both in technical and regulatory contexts.
4. Discuss how deficiencies identified during an inspection are communicated to the licensee and dispositioned by the inspector.
5. State how the goals of the construction inspection program were achieved by the activities performed during the inspection.

TASKS:

1. Accompany a qualified inspector and conduct an inspection of construction activities in progress.
2. Review the applicable site inspection schedule; select an upcoming inspection and discuss your participation in the inspection with the lead inspector.

3. Begin preparations for the inspection by completing the following tasks:

   a. Review applicable licensing basis documentation (PSAR or FSAR, license, ITAAC, etc.) to gain an understanding of requirements for construction to the licensing basis.

   b. Review the applicable IPs to identify the inspection attributes that will be evaluated during the inspection.

   c. Review the applicable project-specific inspection scoping matrix for inspection sample guidance and specific insights.

   d. Review the quality assurance regulatory requirements in 10 CFR Part 50, Appendix B and the licensee's Quality Assurance Program.

   e. Review the applicable licensee implementing procedures and applicable requirements from referenced codes and standards Develop an understanding of any criteria for successful implementation of the item to be inspected.

   f. Locate and review relevant OpE SharePoint Hub and previous inspection reports for the inspection that you are conducting.

   g. Ensure you are familiar with all personnel safety procedures and equipment requirements for the area that you will inspect.

   h. Develop an inspection plan as necessary or as directed incorporating information from the above items. Discuss any questions with a qualified construction inspector.

4. Conduct the inspection entrance meeting, if applicable.

5. Perform an independent observation of the licensee activities selected for inspection. Exercise caution and awareness to not interfere with the licensee's conduct of the activity. Document your observations and any issues or concerns. Ensure that you capture licensee procedure information, information for personnel performing the activities (names, titles), and other relevant information.

6. Discuss any observations or issues (issues of concern) with the lead inspector and provide a preliminary determination as to whether the licensee demonstrated satisfactory quality in accordance with applicable requirements.

7. Determine if any issues of concern identified represent a performance deficiency (refer to IMC 2571) of minor or more-than-minor significance (i.e., a "finding").

8. Conduct the inspection exit meeting, if applicable. If no formal inspection exit meeting is held, then meet with the appropriate licensee point(s) of contact for the inspection.

9. Prepare your report input describing your inspection activities and conclusions and submit them to the lead inspector. If directed, input your inspection activities and results in the ARCOP Inspection Management System (AIMS).

10. Meet with your supervisor or a qualified inspector designated by your supervisor to discuss any questions that you may have as a result of this activity and demonstrate that you can meet the evaluation criteria listed above.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item OJT-CON-1.

(OJT-CON-2) Construction Inspection Project Manager

PURPOSE:

The purpose of this activity is for you to gain understanding of the role of the construction inspection project manager. The construction inspection project manager is the lead inspection planner for the construction project and is vital to successful implementation of the construction inspection and oversight programs, This OJT is written for an advanced power reactor construction project but may be completed for a fuel facility or NPUF construction project. Your supervisor should assign you to the construction project with the most training value and availability.

COMPETENCY AREAS: INSPECTION
COMMUNICATION
FUNDAMENTAL PLANT DESIGN AND CONSTRUCTION

LEVEL OF EFFORT: 20 hours

REFERENCES:

- Licensee's Quality Assurance Program (QAP) procedures.

EVALUATION CRITERIA:

Upon completion of this activity, you will be asked to demonstrate your understanding of the construction inspection project manager's role in the construction oversight program by successfully addressing the following:

1. For a facility selected by your supervisor, describe the facility technology, location, layout, and project specific inspection plan.
2. Review the licensee's construction organization. Identify the functional responsibilities of each department. Identify the major construction contractors.
3. Locate the applicable licensing documents such as the PSAR or FSAR, SER, License, including amendments, and Construction Permit, as applicable. Demonstrate an understanding of the facility's licensing requirements.
4. Review the licensee's and major contractor's Quality Assurance Program Document. Identify the licensee's implementation procedures.
5. Review the licensee's corrective action program. Review examples of issues that have been identified and entered into the program.
6. Identify the types of information discussed in NRC/licensee inspection planning meetings and discuss how the information impacts completion of the construction inspection program for the facility. Attend an inspection planning meeting with a construction licensee.

TASKS:

1. Demonstrate how to obtain copies of selected licensee engineering drawings, installation procedures, and other records.

2. Attend an inspection planning meeting with a construction licensee. Identify an upcoming inspection opportunity and review the applicable inspection manual chapter and relevant inspection procedures for the inspection opportunity. Prepare an inspection plan for the inspection opportunity.

3. Review inspection results and participate in an assessment of the inspection area.

4. Review the documentation of inspection results in AIMS.

5. Meet with your supervisor or the person designated to be your resource for this activity and discuss the items listed in the Evaluation Criteria section.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item OJT-CON-2

(OJT-CON-3) Construction Inspection of Fuel Facilities and NPUFs

PURPOSE:

The purpose of this activity is to familiarize you with a typical construction inspection at a Fuel Cycle Facility or Non-Power Production and Utilization Facility (NPUF) under NRC jurisdiction. This OJT is designed to provide hands-on experience with inspection planning, execution, documentation, and communication, ensuring compliance with NRC regulations and facility licensing bases.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 40 hours

REFERENCES:

Fuel Facilities

- 10 CFR Part 70 “Domestic Licensing of Special Nuclear Material”
- 10 CFR Part 40 “Domestic Licensing of Source Material”
- IMC 2694, “Fuel Cycle Facility Construction and Pre-Operational Readiness Review Inspection Program”
- Applicable Inspection Procedures (see IMC 2694 Appendix A)
- Facility-specific licensing basis documents (e.g., license application, Integrated Safety Analysis (ISA), Management Measures Program)

Non-Power Production or Utilization Facilities (NPUFs)

- 10 CFR Part 50 “Domestic Licensing of Production and Utilization Facilities”
- IMC 2550, “NPUFs Licensed Under 10 CFR Part 50: Construction Inspection Program”
- Applicable Inspection Procedures (see IMC 2550 Appendix A)
- Facility-specific licensing basis documents (e.g., construction permit, operating license application, QA program)

Applicable to both Fuel Facilities and NPUFs

- Applicable Final Safety Analysis Report (FSAR) or Preliminary Safety Analysis Report (PSAR) Sections or Safety Evaluation Report (SER)
- NRC Enforcement Policy

EVALUATION CRITERIA:

Upon completion of this activity, you should be able to:

1. State the actions required to plan and perform a construction inspection at a Fuel Facility or NPUF.

2. Identify and describe licensee and contractor activities to be observed during a construction inspection.

3. Discuss the results of the inspection in both technical and regulatory contexts with the lead inspector.

4. Explain how deficiencies identified during an inspection are communicated to the licensee and dispositioned.

5. State how the goals of the construction inspection program were achieved by the inspection activities performed.

TASKS:

1. Accompany a qualified inspector and conduct an inspection of construction activities in progress at a Fuel Facility or NPUF.

2. Review the applicable site inspection schedule; select an upcoming construction inspection and discuss your participation with the lead inspector.

3. Prepare for the inspection by completing the following:

    a. Review licensing basis documentation (FSAR/PSAR, SER, license or license application, Integrated Safety Analysis (ISA) for fuel facilities, etc.) to become familiar with the nuclear risk-significant structures, systems, and components (SSCs) within the scope of the inspection and any specific construction requirements or commitments.

    b. Review the applicable inspection procedures to understand inspection objectives, requirements, guidance, and resource estimates.

    c. Review quality assurance requirements and the licensee's QA or Management Measures program.

    d. Review and familiarize yourself with licensee implementing procedures and referenced codes/standards. Understand the acceptance criteria for successful completion of the construction activities to be inspected.

    e. Review relevant previous inspection reports for the facility and construction experience (ConE) reports for the activities to be inspected, which have been integrated into the Operating Experience Hub.

    f. Ensure familiarity with all personnel safety procedures and equipment requirements for the area to be inspected.

    g. Develop an inspection plan as necessary or as directed, incorporating information from the above items. Discuss any questions with a qualified inspector.

4. Participate in the inspection entrance meeting, if applicable.

5. Perform independent observation of selected licensee and contractor construction activities. Document observations, issues, and concerns, including relevant procedure and personnel information.

6. Discuss observations and issues with the lead inspector, and provide a preliminary determination regarding licensee compliance and quality.

7. Determine whether any issues identified represent a performance deficiency of minor or more-than-minor significance using guidance from the applicable IMCs and NRC Enforcement Policy. (For fuel facilities, constructing “at-risk” determine whether any issues represent an “open item” using guidance form IMC 2694).

8. Participate in the inspection exit meeting, if applicable.

9. Prepare your report input describing your inspection activities and conclusions and submit to the lead inspector. If directed, enter your inspection activities and results in the NRC’s inspection management system.

10. Meet with your supervisor or a qualified inspector designated by your supervisor to discuss any questions and demonstrate you can meet the evaluation criteria listed above.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item OJT-CON-3

(OJT-CON-4) Project Management for Fuel Facility and NPUF Construction Inspections

PURPOSE:

The purpose of this activity is to familiarize you with the essential project management practices required to plan, execute, and close out inspection activities for Fuel Cycle Facilities and Non-Power Production and Utilization Facilities (NPUFs). This OJT is designed for NRC staff who will serve as project managers or lead inspectors for construction and operational readiness inspections at these facilities.

COMPETENCY AREA: PROJECT MANAGEMENT

LEVEL OF EFFORT: 40 hours

REFERENCES:

Fuel Facilities

- 10 CFR Part 70 “Domestic Licensing of Special Nuclear Material”
- 10 CFR Part 40 “Domestic Licensing of Source Material”
- IMC 2600, “Fuel Cycle Facility Operational Safety and Safeguards Inspection Program”
- IMC 2694, “Fuel Cycle Facility Construction and Pre-Operational Readiness Review Inspection Program”
- IMC 0610, “Nuclear Material Safety and Safeguards Inspection Reports”
- Applicable Inspection Procedures (see IMC 2694 Appendix A)
- Facility-specific licensing basis documents (e.g., license application, Integrated Safety Analysis (ISA), Integrated Safety Analysis Summary (ISAS), Management Measures Program, i.e. Quality Assurance Program Description (QAPD)

Non-Power Production or Utilization Facilities (NPUFs)

- 10 CFR Part 50 “Domestic Licensing of Production and Utilization Facilities”
- IMC 2550, “NPUFs Licensed Under 10 CFR Part 50: Construction Inspection Program”
- Applicable Inspection Procedures (see IMC 2550 Appendix A)
- Facility-specific licensing basis documents (e.g., construction permit, operating license application, QA program)

Applicable to Both Fuel Facilities and NPUFs

- Applicable Final Safety Analysis Report (FSAR) or Preliminary Safety Analysis Report (PSAR) Sections or Safety Evaluation Report (SER)
- NRC Enforcement Policy

EVALUATION CRITERIA:

Upon completion of this activity, you should be able to:

1. Describe the phases and deliverables of project management for Fuel Facility and NPUF inspections.
2. Develop and maintain a project-specific inspection plan and schedule using NRC tools and applicable IMCs.
3. Coordinate inspection team resources, stakeholder communications, and documentation requirements.
4. Identify, assess, and manage risks and issues related to inspection activities.
5. Monitor inspection progress, report status, and implement corrective actions as needed.
6. Conduct project closeout, including lessons learned and support for continuous assessment processes.

TASKS:

1. Accompany a qualified lead inspector or inspection project manager during the planning, execution, and closeout phase of a Fuel Facility or NPUF inspection.
2. Review the applicable inspection schedule, site specific inspection plan, DFFI handbook, and focus area/scoping matrix for an assigned Fuel Facility or NPUF project. Discuss your role and responsibilities with the lead project inspector or project manager.
3. Prepare for project management of the inspection by completing the following tasks:
    a. Review applicable IMCs (2600, 2694 or 2550) and project-specific inspection plans to understand requirements, milestones, and sample expectations.
    b. Review the inspection schedule, resource allocations, and level of effort estimates for the inspection.
    c. Identify key stakeholders (NRC staff, licensee representatives, contractors, project vendors, regional management) and review the communication plan.
    d. Review the focus area matrix or assessment for the inspection project. Discuss risk mitigation strategies with the lead inspector.

e. Familiarize yourself with NRC project management and inspection tracking tools (e.g., Site Specific SharePoint sites, Fuel Facility Collaboration SharePoint Site).

f. Review previous inspection reports, assessment results, enforcement actions and relevant lessons learned for the facility or project.

g. Ensure you are aware of personnel safety, General Employee Training (GET), security, and information protection requirements for site specific inspection activities.

h. Draft or update the inspection project management plan, incorporating the above information. Discuss any site-specific questions with the senior project inspector and project manager assigned to the site.

4. Participate in an inspection planning meeting or status review meeting, if applicable.

5. Perform assigned project management activities during the inspection (e.g., scheduling, resource coordination, risk tracking, stakeholder communications) to include developing a document request, inspection plan, and participation in debrief with the oversight of the assigned senior project inspector for the facility. Document actions, progress, and any issues or concerns. Capture relevant data and communications.

6. Discuss observations, issues, or concerns with the lead inspector or project manager, and provide a preliminary determination of inspection progress and project health.

7. Identify any issues requiring corrective actions or escalation and refer to applicable IMCs for risk assessment and issue management.

8. Participate in an inspection closeout meeting and contribute to the continuous assessment process, including lessons learned and documentation.

9. Prepare a summary report describing your project management activities and conclusions and submit it to the lead project inspector or project manager. If directed, enter your activities and results in the appropriate NRC management system.

10. Meet with your supervisor or a qualified inspection project manager designated by your supervisor to discuss any questions and demonstrate that you meet the evaluation criteria listed above.

DOCUMENTATION: Construction Inspector Technical Proficiency-Level Qualification Signature Card Item OJT-CON-4

Construction Inspector Technical Proficiency-Level Signature Card and Certification

Inspector Name:	Employee Initials/Date	Supervisor's Signature/Date
A. Training Courses		
E-110: Power Plant Engineering (course or self-study)		
Reactor Technology overview (104 P or B)		
Advance Technology Differences Course (R107P)		
F-201 or F-201S: Fuel Cycle Processes		
Quality Assurance Course, as designated by supervisor (e.g., external training such as EPRI Nuclear Utility Procurement Training Course, or similar to NRC E-301)		
B. Individual Study Activities		
ISA-CON-1: Title 10, "Energy," of the *Code of Federal Regulations*		
ISA-CON-2: Overview of 10 CFR Part 21		
ISA-CON-3: Power Reactor Construction Design Control		
ISA-CON-4: Significance of Construction Inspection Findings		
ISA-CON-5: Fuel Cycle Process Fundamentals		
ISA-CON-6: Fuel and Non Power-Producing Facilities		
ISA-CON-7: Industry Codes & Standards		
ISA-CON-8: Construction and Preoperational Testing		
C. Basic-Level Rotations and On-the-Job Training Activities		
OJT-CON-1: Construction Inspection Accompaniment		
OJT-CON-2: Construction Inspection Project Manager		
OJT-CON-3: Construction Inspection of Fuel Facilities and NPUFs		
OJT-CON-4: Project Management for Fuel Facility and NPUF Construction Inspections		

Supervisor's signature indicates successful completion of all required courses and activities listed in this journal and readiness to appear before the Oral Board.

Supervisor's Signature: _____ Date: _____

The appropriate "Construction Inspector Technical Proficiency Level Equivalency Justification" form must accompany this signature card and certification, if applicable.

Form 1: Construction Inspector Technical Proficiency-Level Equivalency Justification

Inspector Name: _____	Identify equivalent training and experience for which the inspector is to be given credit.
A, Training Courses	
E-110: Power Plant Engineering (course or self-study)	
Reactor Technology overview (R-104P or B)	
Advance Technology Differences Course (R-107P)	
F-201 or F-201S: Fuel Cycle Processes	
Quality Assurance Course, as designated by supervisor (e.g., external training such as EPRI Nuclear Utility Procurement Training Course, or similar to NRC E-301)	
B. Individual Study Activities	
ISA-CON-1: Title 10, "Energy," of the *Code of Federal Regulations*	
ISA-CON-2: Overview of 10 CFR Part 21	
ISA-CON-3: Power Reactor Construction Design Control	
ISA-CON-4: Significance of Construction Inspection Findings	
ISA-CON-5: Fuel Cycle Process Fundamentals	
ISA-CON-6: Fuel and Non-Power Producing Facilities	
ISA-CON-7: Industry Codes & Standards	
ISA-CON-8: Construction and Preoperational Testing	
C. On-the-Job Training Activities	
OJT-CON-1: Construction Inspection Accompaniment	
OJT-CON-2: Construction Inspection Project Manager	
OJT-CON-3: Construction Inspection of Fuel Facilities and NPUFs	
OJT-CON-4: Project Management for Fuel Facility and NPUF Construction Inspections	

Supervisor's Approval: _____
Supervisor Signature/Date

Attachment 1: Revision History Sheet for IMC 1245 Appendix C-15

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public)
N/A	ML17072A344 08/15/17 CN 17-014	First issuance. Completed 4-year search for commitments and found none.	None	ML17089A364
N/A	ML21106A282 04/22/21 CN 21-019	Minor editorial change to reflect changed organizational responsibility due to the reunification of NRO and NRR and the replacement of TTC training course G110, “Licensing Reactors under Part 52,” with G113, “Construction Reactor Oversight Process (cROP).”	None	NA
N/A	ML26156A057 09/14/26 CN 26-041	Update Appendix C15 in preparation for the agency’s implementation of ARCOP and anticipated influx of construction of advanced reactors.	N/A	ML26161A332