Appendix B

Construction Inspector General Proficiency-Level Training and Qualification Journal

Introduction

The purpose of this qualification journal is to ensure that inspectors are qualified to perform inspections in accordance with the NRC's Construction Inspection Program. The requirements of this standard are applicable to NRC personnel conducting independent inspections and assessments used to verify acceptability of construction activities and ITAAC determinations. Satisfactory and documented attainment of the requirements contained in this qualification standard will ensure that personnel possess the requisite competence to fulfill functional area duties and responsibilities.

Satisfaction of the minimum standards in this document is not intended to result in an expert level of knowledge. Additional training or education beyond the requirements of this standard would be required to achieve the specialist expertise level necessary to perform detailed disciplinary reviews or assessments within any specific area. In all cases, responsible management shall determine whether an inspector is qualified to inspect specific areas. The qualification journal must provide traceable documentation to show that minimum requirements have been met for each individual functional area.

Note: Some of the Construction Inspection Program Inspection Manual Chapters (IMCs) and other guidance may still be in draft. Use the latest draft IMCs and guidance documents while fully discussing with your supervisor any limitations to using the draft information and the extent of applicability to your training.

Required General Proficiency Training Courses:

Note: You DO NOT have to complete Appendix A before completing the following courses.

Before signing up for any course, be sure that you have checked and have met any prerequisites.

- G-105: Conducting Inspections
- E-301: Quality Assurance Training
- 571: Media Training Workshop
- 100: Effective Communications for NRC Inspectors
- 135: Gathering Information for Inspectors through Interviews

These courses should be completed in the order listed.

- G-105: Conducting Inspections
- G -110: Licensing Reactors under Part 52
- G-113: Construction Inspection Program Course
- F-201 or F-201S: Fuel Cycle Processes/Directed Self-Study*
- R-104 P or R-104 B: Reactor Technology Overview (only one technology required)
- R-107 P, R-107 B , R-108 P, or R-108 B: New Reactor Technology (A minimum of one design is required)

* Branch chiefs may require this course at their discretion or the completion of ISA-General-13

General Proficiency Individual Study Activities

General Proficiency Individual Study Activity

TOPIC: (ISA-General-1) Corrective Action Program

PURPOSE: This activity will provide you with a working knowledge of the licensee programs and documents that were established to meet the requirements for an effective problem identification and corrective action program as outlined in 10 CFR 50 Appendix B Criterion XVI.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 20 Hours

REFERENCES: IP 71152, "Identification and Resolution of Problems"

IP 35007, "Quality Assurance Program Implementation During Construction and Pre-Construction Activities"

Site Specific documents which describe the Licensee's corrective action program

10 CFR 50, Appendix B, Criterion XVI

EVALUATION CRITERIA: At the completion of this activity, you should be able to discuss the principle elements necessary for an effective licensee Corrective Action Program (CAP).

TASKS:

1. Gain an understanding of the licensee's CAP through a combination of discussions with a qualified inspector and review of implementing procedures. Focus on all steps necessary from identification of a condition adverse to quality through final resolution.

2. Using IP 35007 and 71152 for guidance, review a sample of about six issues entered into the licensee's CAP and compare the licensee's actions versus regulatory requirements. Discuss the resolution of the issues with the resident inspector.

3. Meet with your supervisor or a qualified resident inspector 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: General Proficiency Qualification Signature Card Item ISA-General-1

General Proficiency Individual Study Activity

TOPIC: (ISA-General-2) Technical and Regulatory Issues

PURPOSE: This activity will familiarize you with various topics of interest that have proven problematic in the past.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 7 hours

REFERENCES: NRC Web-based Training (refer to the NRC Human Resources Training and Development Website)

SECY-06-0114, "Description of the Construction Inspection Program for Plants Licensed Under 10 CFR Part 52," Enclosures 1 and 2

NUREG 1789, "10 CFR Part 52 Construction Inspection Program Framework Document," Appendix B

EVALUATION CRITERIA: At the completion of this activity, you should be able to:

1. Discuss the general topics presented in the Web-Based Training, specifically a basic knowledge of the technical/regulatory issues and their application to the NRC.

2. Discuss the construction inspection lessons learned documented in SECY-06-0114 Enclosures 1 and 2, and in NUREG 1789, Appendix B.

TASKS:

1. Complete the following Web-Based Training listed at the Referenced web page:

    a. Review of Columbia Space Shuttle
    b. Effects of Corrosion
    c. Safety Culture ROP Training

2. Gain a general understanding of the technical/regulatory issues and their applications to the NRC.

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

DOCUMENTATION: General Proficiency Qualification Signature Card Item ISA-General-2

General Proficiency Individual Study Activity

TOPIC: (ISA-General-3) Overview of 10 CFR Part 50 and 10 CFR Part 52

PURPOSE: The purpose of this activity is to acquaint you with the regulations that specify the requirements for all aspects of the licensing and construction of a nuclear reactor using 10 CFR Part 52. This individual study activity will help you to understand the content of 10 CFR Parts 50 & 52 and how to locate specific requirements.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 20 hours

REFERENCES: NRC Internal Home Page

10 CFR Parts 50 & 52

NUREG/BR-0298, "Nuclear Power Plant Licensing Process," Rev.2

EVALUATION CRITERIA: Upon completion of the tasks in this activity, you will be asked to demonstrate your understanding of the general content of 10 CFR Parts 50 & 52 by successfully discussing the following:

1. State the purpose of Part 50.

2. State the purpose of Part 52.

3. Explain the basis and criteria for the licensing of nuclear plants.

4. Recognize and locate specific topics presented in 10 CFR Part 52.

5. Discuss the definitions of following terms used in 10 CFR Part 52:

    a. early site permit
    b. standard design
    c. standard design certification
    d. combined license

6. Discuss the importance of the inspections, tests, and analyses discussed in 10 CFR 52.47(b)(1) to the overall licensing of a new nuclear power plant. Explain why there are no inspections associated with standard design certification.

7. Explain the differences in the process for licensing plants under 10 CFR Part 50 and 10 CFR Part 52.

TASKS:

1. Become familiar with, and be able to use the search feature to locate the information available in NRC Regulations & Nuclear Regulatory Legislation web pages presented on the NRC's Internal Web Site to search CFR Part 50 and CFR Part 52.

2. Read and be familiar with the following sections of Part 50: 50.7, 50.9, 50.10, 50.49, 50.55, 50.55a, 50.59, 50.70, 50.71, 50.72, 50.73, Appendix A and Appendix B.

3. Read Part 52 in its entirety with emphasis in the following sections: 52.1, 52.4, 52.5, 52.6, 52.24, 52.25, 52.39, 52.54, 52.71, 52.73, 52.79, 52.91, 52.97, 52.99, 52.103 and 52.104.

4. Read NUREG/BR-0298, "Nuclear Power Plant Licensing Process", Rev.2. This document is available on the NRC's external website and may be available in hard copy from each region's Office of Public Affairs. Compare the topics covered in the NUREG to the topics covered in Part 52.

5. Locate the subpart in 10 CFR Part 52 where Early Site Permits are discussed. Read all paragraphs related to ESPs including § 52.17 which address the technical information that must be submitted by the applicant and is reviewed by the NRC. Then, review IMC 2501, Construction Inspection Program: Early Site Permits. Compare the inspections conducted under IMC 2501 to the ESP topics being evaluated by the NRC.

6. Review 10 CFR Part 52, Subpart B on standard design certification. Pay particular attention to §52.47(b)(1), which discusses the inspections, tests, analyses and acceptance criteria of the design.

7. Review 10 CFR Part 52, Subpart C on combined licenses. Pay particular attention to § 52.79. Scan the technical information that must be in the application for a COL.

8. 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: General Proficiency Certification Signature Card Item ISA-General-3

General Proficiency Individual Study Activity

TOPIC: (ISA-General-4) Overview of 10 CFR Part 40

PURPOSE: The purpose of this activity is to acquaint you with the regulations that specify the requirements for all aspects of the Domestic Licensing of Source Material. This individual study activity will help you to understand the content of Part 40 and how to locate the specific requirements for any subject.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 4 hours

REFERENCES: NRC Internal Website

10 CFR Part 40, latest revision, "Domestic Licensing of Source Material"

EVALUATION CRITERIA: Upon completion of the tasks in this activity, you will be asked to demonstrate your understanding of the general content of 10 CFR Part 40 by successfully discussing the following:

1. State the purpose of Part 40.

2. Given a specific subject, identify which section in Part 40 discusses the requirements for that subject by using the search feature on the NRC Regulations & Nuclear Regulatory Legislation Internal web pages.

TASKS:

1. Become familiar with, and be able to use the search feature to locate, the information available in NRC Regulations & Nuclear Regulatory Legislation web pages presented on the NRC's Internal Website.

2. 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: General Proficiency Certification Signature Card Item ISA General-4

General Proficiency Individual Study Activity

TOPIC: (ISA-General-5) Overview of 10 CFR Part 70

PURPOSE: The purpose of this activity is to acquaint you with the regulations that specify the requirements for all aspects of Domestic Licensing of Special Nuclear Material. This individual study activity will help you to understand the content of Part 70 and how to locate the specific requirements for any subject.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 7 hours

REFERENCES: NRC Internal Website

10 CFR Part 70, latest revision, "Domestic Licensing of Special Nuclear Material"

EVALUATION CRITERIA: Upon completion of the tasks in this activity, you will be asked to demonstrate your understanding of the general content of 10 CFR Part 70 by successfully discussing the following:

1. State the purpose of Part 70.

2. Given a specific subject, identify which section in Part 70 discusses the requirements for that subject by using the search feature on the NRC Regulations & Nuclear Regulatory Legislation Internal web pages.

3. Explain the performance requirements of 10 CFR 70.61.

4. Explain how the IROFS and Management Measures contribute to risk reduction and accident mitigation, and how they factor into the Integrated Safety Analysis (ISA).

TASKS:

1. Become familiar with, and be able to use the search feature to locate, the information available in NRC Regulations & Nuclear Regulatory Legislation web pages presented on the NRC's Internal Website.

2. Discuss with a qualified Fuel Facility Operations inspector, the ISA Methodology used by your assigned facility licensee. Include in the discussion the following topics:

a. Performance Requirements
b. IROFS
c. Management Measures
d. Facility Change Process
e. Reporting Requirements

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: General Proficiency Certification Signature Card Item ISA-General-5

General Proficiency Individual Study Activity

TOPIC: (ISA-General-6) Overview of 10 CFR Parts 19 and 20

PURPOSE: The purpose of this activity is to familiarize you with Parts 19 and 20 of the NRC regulations. These regulations are generic to any position within the Agency. This individual study activity will help you understand the purpose of Parts 19 and 20 and provide you with some basic knowledge that all NRC inspectors will use when conducting inspections in radiologically-controlled areas.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 4 hours

REFERENCES: NRC Internal Website

10 CFR Part 19, "Notices, Instructions, and Reports to Workers: Inspection and Investigations"

10 CFR Part 20, "Standards for Protection Against Radiation"

EVALUATION CRITERIA: Upon completion of this activity, you will be asked to demonstrate your general understanding of Parts 19 and 20 and why these regulations are important for all inspectors, by successfully addressing the following:

1. Describe the general purpose of Part 19.

2. Identify the section of Part 19 that describes the rights of radiation workers if they believe a violation of radiological working condition requirements has occurred.

3. Identify the section of Part 19 that requires a licensee to report doses to workers.

4. Describe the purpose of Part 20.

5. Identify the relevant section of Part 20 and discuss the various radiological circumstances that would require a licensee to notify the NRC.

6. Discuss why it is important for every NRC inspector to have a general understanding of Part 19 and 20.

TASKS:

1. Review Part 19 for a general understanding of the following:

    a. The purpose of Part 19 (19.1)
    b. Documents are required to be posted (19.11(d) and (e))
    c. Requirements for promptly identifying any condition that may cause unnecessary exposure (19.12(a)(4))
    d. Instructions for individuals in a restricted area that may experience unnecessary exposure to radiation and/or radioactive materials (19.12(a)(5))
    e. What times the NRC is allowed to inspect a facility (19.14(a))
    f. Requests by workers for an NRC inspection (19.16(a))

2. Review Part 20 for a general understanding of the following:

    a. The purpose of Part 20 (20.1001)
    b. Occupational dose limits for adults (20.1201)
    c. Occupational dose limits for members of the public (20.1301)
    d. Concepts of ALARA (20.1101)
    e. Conditions requiring individual monitoring of external and internal occupational dose (20.1502)

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: General Proficiency Certification Signature Card Item ISA-General-6

Basic-level Individual Study Activity

TOPIC: (ISA-General-7) Periodic Assessment of Construction Inspection Program Results

PURPOSE: The purpose of this study activity is for you to obtain a broad overall knowledge of the process for performing Periodic Assessment of Construction Inspection Program Results for new reactor and fuel facility construction. Upon completion of this study activity, you will have the necessary background to understand how inspection results are used to perform licensee performance assessments and to make inspection resource allocation decisions.

COMPETENCY AREAS: ASSESSMENT
REGULATORY FRAMEWORK

LEVEL OF EFFORT: 24 hours

REFERENCES: IMC 2505, "Periodic Assessment of Construction Inspection Program Results"

IMC 0613, “Documenting 10 CFR Part 52 Construction and Test Inspections”

IMC 2630-Appendix B, “Mixed-Oxide Fuel Fabrication Facility Assessment of Applicant Performance (AAP) Process”

IMC2696-Appendix B, “Louisiana Energy Services (LES) National Enrichment Facility (NEF) Gas Centrifuge Inspection Program Assessment of Licensee Performance (ALP) Process”

EVALUATION CRITERIA: After completing this study activity, you will demonstrate your understanding of how the Periodic Assessment of Construction Inspection Program Results is performed by successfully doing the following:

1. State how continuous assessment is performed.

2. State the purpose of annual assessment.

3. State the types of information contained in CIPIMS that support the Periodic Assessment of Construction Inspection Program Results.

4. State how this information is used to arrive at objective

assessments of licensee performance that is timely and predictable.

5. State the purpose of the Construction Action Matrix in IMC 2505 and describe the different facility performance designations and applicable agency actions for each designation.

TASKS:

1. Read IMC 2505 to gain an understanding of how the NRC assesses licensee performance and the actions the NRC takes for varying levels of licensee performance.

2. Read IMC 2630-Appendix B and IMC 2696-Appendix B to gain an understanding of how the NRC assesses the licensee or applicant performance and the actions the NRC takes for varying levels of licensee performance.

3. Locate the Construction Action Matrix and the historical inspection performance data used to perform periodic assessments.

4. Locate the publically available Construction Inspection Program Results.

5. Attend an assessment review meeting to gain an understanding of the purpose of the meetings, the information discussed, and the decisions made. You should attend the assessment review meeting that will maximize your exposure to the assessment program. Whenever possible, attend a meeting that includes a discussion of safety-significant findings.

6. Meet with your supervisor or the person designated to be your resource for this activity to discuss the items listed in the evaluation criteria section.

DOCUMENTATION: General Proficiency Certification Signature Card Item ISA-General-7

General Proficiency Individual Study Activity

TOPIC: (ISA-General-8) Construction QA and Defect Reporting Requirements

PURPOSE: The purpose of this activity is to familiarize inspectors with the regulatory provisions that require licensees to have a quality assurance program and to report deficiencies. In addition to inspections that support the determination that ITAAC have been met, additional inspections will be needed to provide assurance that the licensee's processes for oversight of construction activities are effective. The successful implementation of a comprehensive QA program by the licensee will be an important indicator of the licensee's ability to manage the various activities associated with a large construction project. This activity will highlight the relationship between Part 52 and the requirements in Part 50 that relate to quality assurance and defect reporting.

COMPETENCY AREAS: INSPECTION

LEVEL OF EFFORT: 24 hours

REFERENCES: 10 CFR Part 50, Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.”

Inspection Procedure 35007, ”Quality Assurance Program Implementation During Construction”

Inspection Procedure 35017, “Quality Assurance Implementation Inspection.”

10 CFR 50.55, "Conditions of Construction Permits" (Note: the applicable provisions of 10 CFR 50 have been incorporated into Part 52 by reference and not all the requirements of part 50.55 pertaining to construction permits will apply to Part 52)

10 CFR Part 21, “Reporting of Defects and Noncompliance”

Regulatory Guide 1.28, “Quality Assurance Program Requirements (Design and Construction)”

ASME NQA-1, “Quality Assurance Requirements for Nuclear Facility Application”

NUREG 1055, "Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants, (A Report to Congress), March, 1987." (A hard copy of this report is available in each region)

EVALUATION CRITERIA:

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

1. Explain how 10 CFR Parts 50 and 21 requirements are invoked by 10 CFR Part 52.

2. Identify the Appendix B criteria and describe how an inspection would verify that they are correctly implemented during construction activities.

3. Discuss the basis for the applicability of Part 21, “Reporting of Defects and Noncompliance” to applicants, licensees, vendors and suppliers. Define a defect in the context of Part 21.

4. Describe the notification requirements of § 50.55(e) and explain the relationship of this part to 10 CFR Part 50 and Part 21.

5. Discuss the American National Standards (ANSI) and American Society of Engineers (ASME) guidance that is endorsed by Reg Guide 1.28 and explain the exceptions to the guidance (contained in Reg Guide 1.28) which are required to be met in order for a licensee or vendor to use the endorsement.

6. Describe the applicability of ASME NQA-1 and explain the content of the various parts.

TASKS:

1. Read § 52.17, 52.47, and 52.79 to determine the requirements to apply quality assurance.

2. Review 10 CFR Part 50, Appendix B and Inspection Procedures 35007 and 35017. Compare the criteria with the inspection attributes in the IPs and pay particular attention to the IP guidance.

3. Review 10 CFR Part 21 with particular focus on the § 21.21 requirements for evaluating defects and for reporting them.

4. Read 50.55(e) and determine what actions must be completed by licensees to satisfy these requirements.

5. Review RegGuide 1.28 and focus on the additions and modifications to ANSI/ASME NQA-1 identified in Section C,

"Regulatory Position."

6. Review ASME NQA-1.

7. Read NUREG 1055 and note the root causes for past construction problems.

8. 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: General Proficiency Certification Signature Card, Item ISA-General-8

General Proficiency Individual Study Activity

TOPIC: (ISA-General-9) Construction Inspection Program

PURPOSE: The purpose of this activity is to introduce the requirements that form the basis of the Construction Inspection Program. This activity will provide you with knowledge of the Manual Chapter requirements that will be implemented to inspect all phases of new reactor construction.

COMPETENCY AREAS: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 24 hours

REFERENCES: IMC 2501, "Early Site Permits"

IMC 2502, "Construction Inspection Program: Pre-Combined License (Pre-COL) Phase"

IMC 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)"

IMC 2504,"Construction Inspection Program - Inspection of Construction and Operational Programs"

IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document"

IMC 2507, "Construction Inspection Program: Vendor Inspections"

IMC 2508, "Construction Inspection Program: Design Verification"

IP 65001, "Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Matrix Inspections"

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"

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

1. Discuss the program requirements contained in the construction inspection program Manual Chapters and in IP 65001.

2. Discuss the fuel facility construction inspection program requirements contained in the Manual Chapters 2630 and 2696.

3. Discuss the requirements of the CFR to the inspection objectives of the construction inspection program by comparing the various steps of the licensing process to the objectives of Inspection Manual Chapters 2501, 2502, 2503, 2504 and 2508 of the construction inspection program.

4. Discuss how inspection information will be used to support the Commission decision that the licensee can load fuel and operate the plant.

5. Discuss how the vendor inspection program supports vendor construction for new reactors.

6. Discuss how the Mixed Oxide Fuel Fabrication Facility (MOX) Construction Inspection program requirements will verify that the construction of the principal systems, structures, and components (PSSCs) and items relied on for safety (IROFS) have been completed in accordance with the construction authorization and license application to possess and use special nuclear material.

7. Discuss how the "Louisiana Energy Services" (LES) construction inspection program requirements will verify that the construction of the IROFS was completed in accordance with the documents comprising the license application (Safety Analysis Report (SAR), etc.); the Integrated Safety Analysis (ISA), the Integrated Safety Analysis Summary (ISAS), and the Safety Evaluation Report (SER).

TASKS:

1. Review IMC 2501, 2502, 2503, 2504, 2506, 2507 and 2508 and IP 65001.

2. Review § 52.79 on contents of application. Compare the inspections in IMC-2504 to the topical areas in § 52.79.

3. Read § 52.99 on inspections during construction. Pay particular attention to the requirements of § 52.99(e)(1).

4. Read § 52.103 on operation under a combined license. Pay particular attention to § 52.103(g).

5. Review IMC 2630 and IMC 2696.

6. 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: General Proficiency Certification Signature Card, Item ISA-General-9

General Proficiency Individual Study Activity

TOPIC: (ISA-General-10) Design Control Document

PURPOSE: The purpose of this activity is for you to learn about a key document related to the licensing and construction of a new plant under 10 CFR Part 52. A design control document (DCD) is a repository of information about a standard design certified under 10 CFR Part 52. Under Part 52, a reactor design can be submitted to the NRC for review and approval, even if there are no applicants to build the plant. The applicant submits sufficient design information such that the staff can make an overall determination of the design adequacy as it relates to safety and risk. Typically, the information needed to certify a design includes the principal plant systems and components and their corresponding inspections, tests, analysis, and acceptance criteria (ITAAC). In addition to the detailed design information, the applicant also provides information about the site parameters (the postulated physical, environmental, and demographic features of an assumed site) for a plant and the other system interfaces that will be needed to support the safe operation of the reactor. Part 52 also requires the applicant to provide other types of information for use in the future when an applicant for a combined license references an already certified design.

This ISA focuses on the AP1000 and ABWR DCDs with the intent of highlighting the differences in these documents. This approach will show how these and future DCDs may vary and should sensitize the inspector to the differences that can be encountered from various certified designs.

COMPETENCY AREAS: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 8 Hours per design

REFERENCES: 10 CFR Part 52

IMC 2508, “Construction Inspection Program: Design Certification.”

Design Control Documents

EVALUATION CRITERIA: At the conclusion of this activity, and as determined by the supervisor, the inspector should be able to:

1. Define the following terms:

a. Design Control Document (DCD)
b. Tier 1
c. Tier 2
d. Tier 2*
e. ITAAC
f. Design Acceptance Criteria (DAC)

2. Explain the relationship between Tier 1 and Tier 2 information.

3. Describe the kind of information required to be provided by a COL applicant as described in the DCD.

4. Compare and contrast the methods required to make changes to the information contained in Tiers 1, 2 and 2*.

5. Locate the ITAAC information and tables in the DCD.

6. Identify the kind of information available in the Tier 2 section of the DCD.

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

8. Discuss in detail the different definitions of “as built” in each design. Describe how these differences can affect inspection planning.

TASKS:

1. Locate the DCD for the AP1000 and the ABWR on the Construction Inspection Program webpage. This site can be accessed via ROP Digital City and the NRO websites.

2. Look at the organization of both DCDs.

3. Read the Introduction to the DCD section for each design.

4. Review Chapter 1 of Tier 1 for each design. Within the General Provisions sections take particular note of:

   a. Treatment of individual items
   b. Implementation of ITAAC
   c. Verification for Basic Configuration for Systems for ABWR

   Consider how the differences between these sections may affect inspection planning.

5. In both DCDs review the content, format and presentation of the ITAAC

6. Read the definitions for the terms listed in evaluation criterion 1 a-f, in both the AP1000 and the ABWR.

7. Review the content and format of Tier 2 for AP1000 and ABWR.

8. Go to NUREG-0800, the Standard Review Plan. Locate chapter 14.3. Read the description of Design Acceptance Criteria (DAC).

9. Review the ITAAC for Human Factors Engineering for both designs as related to DAC.

10. 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: General Proficiency Certification Signature Card, Item ISA-General-10

General Proficiency Individual Study Activity

TOPIC: (ISA-General-11) Report Writing and Construction Inspection Program Information Management System (CIPIMS)

PURPOSE: The purpose of this activity is to familiarize inspectors with the program requirements required to document construction inspection activities. Note: The CIPMS program is still in development and knowledge desire by this ISA can best be obtained by discussion with your supervisor or a designated CIPMS subject matter expert.

COMPETENCY AREAS: INSPECTION

LEVEL OF EFFORT: 16 hours

REFERENCES: IMC 0613, "Documenting 10 CFR Part 52 Construction and Test Inspections"

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

1. Describe how inspection results will be documented and what a construction inspection report will look like.

2. Explain how inspection findings are characterized and what the different types of findings are.

3. Explain how CIPIMS is used in documenting inspection findings and in developing inspection reports. Describe the specific inputs into CIPIMS.

TASKS:

1. Read IMC 0613 and understand the requirements for characterizing and documenting inspection findings.

2. 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.

3. Describe how an inspection item related to or specifically applicable to an ITAAC should be inspected and documented in the Inspection Report and CIPIMS.

DOCUMENTATION: General Proficiency Certification Signature Card, Item ISA-General-11

General Proficiency Individual Study Activity

TOPIC: (ISA-General-12) Industry Codes & Standards - General

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-General-12

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 RG (guidelines) and industry standards (accepted methodologies).
3. Identify the RG and associated industry standards that address the 10 CFR 50, Appendix B, QA Criteria.
4. Discuss the topics included in the RG and industry standards associated with each.

TASKS:

1. For the appropriate technical area, review each of the documents listed in the attached list of references.
2. 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: General Proficiency Certification Signature Card, Item ISA-General-12

References for ISA-General-12

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

General Proficiency Individual Study Activity

TOPIC: (ISA-General-13) 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
(F201S) 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 UF6 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 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-General-13
Or
General Proficiency Certification Signature Card Item Training Course F-201/F201S: Fuel Cycle Process/Directed Self Study

General Proficiency Individual Study Activity

TOPIC: (ISA-ASME-1) Regulatory Basis for the Requirements Specified in the American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code (Code)

PURPOSE: The purpose of this activity is to familiarize you with the federal regulations which incorporate by reference the requirements of the ASME Code for design, fabrication, erection, testing, and inspection of the reactor coolant system and associated auxiliary, control, and protection systems.

COMPETENCY AREA: REGULATORY FRAMEWORK

LEVEL OF EFFORT: 40 Hours

REFERENCES: 10 CFR 50.55a

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

Proposed Rule for 10 CFR Part 52 (71 FR 12885)

EVALUATION CRITERIA: At the completion of this activity the inspector should be able to:

1. Identify the sections in the Code of Federal Regulations (CFR) which mandate the use of the ASME Code for construction of the reactor coolant pressure boundary and associated auxiliary, control, and protection systems.

2. Identify the Code editions and addenda that have been endorsed by the NRC staff relative to the following ASME Code Sections:

    a. ASME III, Rules for Construction of Nuclear Facility Components
    b. ASME XI, Rules for In-Service Inspection of Nuclear Plant Components
    c. ASME OM Code, ASME Code for Operation and Maintenance of Nuclear Power Plants

3. Identify the locations of the listing of limitations and modifications which the NRC has imposed on the use of the Code editions currently endorsed by the staff.

4. Describe the requirements a licensee must follow before using proposed alternatives to the requirements of the ASME Code editions currently endorsed by the NRC.

5. Identify the ASME Code Class requirements specified in the CFR for construction of components classified as NRC Quality Groups A, B, and C.

6. Explain how the ASME Code requirements are incorporated in the regulations for combined license applications and new reactor construction in accordance with 10 CFR Part 52.

TASKS:

1. Read the 10 CFR 50 Appendix A GDC, especially GDC 1, 14, 15, 30, 31, and 32, to become familiar with the minimum requirements established for the principal design criteria for the reactor coolant system for water-cooled nuclear power plants.

2. Read 10 CFR 50.55a(b) to understand how the ASME Code has become approved for incorporation by reference into the CFR.

3. Read 10 CFR 50.55a(b)(1), b(2), and b(3) to understand which editions and addenda of the ASME Code have been reviewed and endorsed by the NRC staff, including identification of any limitations imposed by the staff on their usage.

4. Read 10 CFR 50.55a(c), (d), and (e) to recognize the Code design requirements established for components categorized by the NRC as Quality Groups A, B, and C components.

5. Become familiar with the proposed rule for 10 CFR Part 52 published in the Federal Register (71 FR 12885). Specifically, read the proposed new rule in 10 CFR 52.79(a)(11), and note the incorporation of 10 CFR 50.55a into the Part 52 regulations for new construction.

6. 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: Qualification Signature Card, Item ISA-ASME-1

General Proficiency Individual Study Activity

TOPIC: (ISA-ASME-2) American Society of Mechanical Engineers Boiler & Pressure Vessel Code, Section III (ASME Code, or Section III) Overview

PURPOSE: The ASME Code, Section III has been incorporated by reference into the Code of Federal Regulations (CFR). 10 CFR 50.55a effectively mandates use of the ASME Code, Section III for design, construction, nondestructive examination, testing, code certification stamping, and overpressure protection of new components used in nuclear power plants. For this reason, it is necessary that inspectors have a general understanding of the scope of Section III, and the applicability and limitations of its rules. This general understanding will provide the foundation for more detailed understanding of selected Articles of Section III directly related to the inspector's duties. These insights will also facilitate the inspection of certain Part 52 COL ITAAC which requires some knowledge of ASME Code reports and documentation.

COMPETENCY AREA: TECHNICAL AREA EXPERTISE
REGULATORY FRAMEWORK

LEVEL OF EFFORT: 40 Hours

REFERENCES: ASME Code, Section III, Subsection NCA, General Requirements for Division 1 and Division 2

"Companion Guide to the ASME Boiler & Pressure Vessel Code; Criteria and Commentary on Select Aspects of the Boiler & Pressure Vessel and Piping Codes," Volumes 1, 2, and 3, edited by K.R. Rao, ASME Press, New York, 2006.

10 CFR 50.55a, Codes and Standards

EVALUATION CRITERIA: At the completion of this activity the inspector should be able to:

1. Identify and explain the differences in the various Divisions of the ASME Code, Section III.

2. Identify and discuss the limits of the ASME Code, Section III rules, including use of Code editions, Addenda, and Code Cases.

3. Identify the location of the ASME Code Glossary which defines selected terms commonly used throughout ASME III.

4. Identify the principal ASME Code-specified documents requiring certification, by either a Registered Professional Engineer or by the Authorized Nuclear Inspector, that a component has been constructed in accordance with Code requirements. Discuss the importance of these documents to inspections and closure of ASME Code-related ITAAC.

5. Identify the ASME Code-specified document which establishes the design basis for a component, including loadings and load combinations, and defines appropriate Design, Service, and Test Limits for construction of ASME classified components.

6. Compare and contrast the ASME Code Service Limit A, B, C, and D provisions for damage allowed to a component while still satisfying the Code Service Limits A through D.

7. Identify the general duties of the Authorized Nuclear Inspector (ANI), and discuss some of the principal functions of the ANI in the certification process for Code component construction.

8. Explain how to access the electronic version of the ASME Boiler & Pressure Vessel Code from the NRC website.

TASKS:

1. Access the ASME Boiler & Pressure Vessel Code on the NRC website by the following steps:

   a. From the NRC home page select 'Information Resources'
   b. Scroll down to the Codes & Standards section and select 'IHS Codes & Standards'
   c. Follow the access directions by again selecting 'IHS Codes & Standards'
   d. From the IHS menu select 'Specs & Standards'
   e. From the 'Quick Searches' pull-down menu select 'Table of Contents'
   f. Select the ASME Code edition desired
   g. Select the ASME Code Section desired, e.g., ASME III

2. Read ASME III, Articles NCA-1110 and NCA-1130 to understand the differences in types of items addressed by the rules of the various Divisions of the ASME Code, and to become aware of the basic limitations on applicability of these ASME Code rules.

3. Read ASME III, Article NCA-9000 to become aware of specific definitions of terms commonly used within the ASME III Code.

4. Read ASME III, Article NCA-1140 to understand the basis for use of Code editions, Addenda, and Code Cases, and to understand the impact that 10 CFR 50.55a has on their usage.

5. Read the following ASME III Articles to identify the ASME Code reports, and their basic provisions, required for certification that components have been constructed in accordance with Code requirements:

    a. NCA-3250, Provision of Design Specifications
    b. NCA-3260, Review of Design Report
    c. NCA-3555, Certification of Design Report
    d. NCA-3270, Overpressure Protection Report
    e. NCA-3280, Owner's Data Report and Filing
    f. NCA-3340, Design Drawings and Construction Specification Division 2)
    g. NCA-3350, Design Report (Division 2)
    h. NCA-3360, Certification of the Construction Specification, Design Drawings, and Design Report (Division 2)
    i. NCA-3380, Certification of Construction Report (Division 2)
    j. NCA-3454, Contents of the Construction Report (Division 2)
    k. NCA-5290, Data Reports and Construction Reports (Divisions 1 and 2)

6. Read ASME III, Article NCA-2140 to identify the principal document, and its major provisions, for establishment of the design basis for ASME components.

7. Read ASME III, Article NCA-2142.4 to understand the differences between the various ASME Service Limits, and to be able to discuss the service-related component damage implications of each Service Limit.

8. Read ASME III, Article NCA-5200 to understand the requirements for ASME Code authorized inspections implemented by the Authorized Nuclear Inspector.

9. Read Chapter 5 of Reference 2 for a concise introduction to the general requirements of ASME Section III, Divisions 1 and 2. Other chapters of Reference 2 provide outline summaries for all other provisions of the ASME Code, and offer a usable source of Code-related information which can be used as a roadmap to the more detailed requirements contained in the various ASME Code Sections.

10. 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: Qualification Signature Card, Item ISA-ASME-2

General Proficiency
Rotation and On-the-Job Activities

General Proficiency Rotation

TOPIC: (ROT-General-1) Operating Reactor Site

PURPOSE: The purpose of this activity is to: (1) acquaint you with the general layout of a facility; (2) instruct you in the types of industrial and radiological (if applicable) personal protection requirements and the proper method of complying with these requirements; (3) instruct you in the use of security procedures, if applicable; and (4) instruct you in the proper response to an emergency if the emergency is declared while in the facility.

Note: Completion of this activity should be accomplished at an operating reactor facility (if possible), but may be accomplished at a new reactor facility that is under construction.

COMPETENCY AREAS:
INSPECTION
COMMUNICATION
FUNDAMENTAL PLANT DESIGN AND OPERATION
EMERGENCY RESPONSE

LEVEL OF EFFORT: Minimum 2 weeks

REFERENCES: Licensee's drawing(s) of the site building layouts

NRC external Web page, Emergency Preparedness and Response

EVALUATION CRITERIA: Upon completion of this activity, you will be asked to demonstrate your understanding of the general plant layout and inspector behavior in the plant by successfully addressing the following:

1. Given a drawing of the site building layout, be able to identify where the major facility areas are located or are to be located.

2. Identify the types of personnel industrial safety equipment that are required and the circumstances under which each piece of equipment should be used.

3. Given specific scenarios related to emergency response situations, discuss the proper response in the event an emergency is declared while in the facility, as applicable, and the

actions you would take.

4. Given specific scenarios related to health physics situations, describe what actions you would take, if applicable. Explain how you would know what type(s) of radiological protection equipment are required before entering a radiologically controlled area (RCA).

5. Given specific scenarios related to security situations, describe what actions you would take.

6. Discuss the proper response in the event of a radiological control event or anomaly, as applicable.

7. Identify the types of information discussed in the plan of the day meeting (POD) - work control meeting that are important to an inspector and discuss why the information is important.

8. Given specific examples, be able to discuss if it is appropriate for an inspector to participate in the discussion at or about the POD - work control meeting.

TASKS:

1. Tour the facility with a qualified inspector. Locate the major buildings and rooms including control room, Technical Support Center, document control. Locate all the major system components such as:

   a. Reactor Coolant and Support Systems (As accessible, Includes chemical and volume control systems)

   b. Secondary Systems
      i. Main steam and turbine
      ii. Condensate and feedwater
      iii. Circulating water and service water

   c. Engineered Safety Features (ESF)
      i. Emergency core cooling systems
      ii. Emergency feedwater or RCIC

   d. Electrical Power System
      i. Offsite power (AC)
      ii. Normal auxiliary (AC)

   e. Emergency power (AC and DC) including diesel generators, switchboards, batteries, inverters, and major circuit breakers

f. Instrumentation and Control Systems
   i. Cable spreading room
   ii. Remote shutdown equipment and instrumentation
   iii. Reactor protection system
   iv. Radiation monitors

g. Security, alarm, and access system (CAS and SAS)

2. If applicable, enter the RCA with a qualified inspector and tour the area to observe and/or discuss items such as: different radiological control postings, methods of designating areas that have additional radiological control requirements for entry, different radiological control clothing requirements for different areas, use of portal monitors and personal friskers, and monitoring personal dosimetry.

3. If possible, tour an area of the plant that the Radiation Work Permit (RWP) requires dress out in PCs.

4. During the walkdown, discuss the proper security procedures for entering different areas, including the actions to take in the event a procedure error or violation of security rules is committed or observed, as applicable.

5. Review the licensee's organization chart. Outline the responsibility of each organization and then, either observe a POD - Work Control Meeting or review a POD - work control document with a qualified inspector.

6. Perform Control Room observations of activities including shift turnovers. Spend approximately four hours in the control room observing the activities of the Senior Reactor Operator, Shift Technical Advisor, and Reactor Operator. From the Control Room, identify instrumentation used to determine key reactor plant parameters such as power, pressure, level, temperature. Be able to explain how these parameters are measured.

7. Follow a set of rounds with an auxiliary operator.

8. Observe activities in the licensee's work control center or similar area.

9. If possible, witness the execution and removal of a tag out performed by the licensee.

10. 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: General Proficiency Certification Signature Card, Item ROT – General-1

General Proficiency On-the-Job Activity

TOPIC: (OJT-General-1) Inspection Entrance/Exit Meetings

PURPOSE: The purpose of this activity is to familiarize an inspector with entrance and exit meetings for a typical construction inspection.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 8 hours

REFERENCES: IP 30703, "Management Meetings Entrance and Exit Interviews"

Applicable Inspection Procedures

EVALUATION CRITERIA: Upon completion of the tasks, the inspector should be able to:

1. Demonstrate proficiency in conducting entrance and exit meetings.

TASKS:

1. Under the supervision of a qualified construction inspector or supervisor, conduct an entrance meeting.

2. Under the supervision of a qualified construction inspector or supervisor, conduct an exit meeting.

DOCUMENTATION: General Proficiency Qualification Signature Card Item OJT-General-1

General Proficiency On-the-Job Activity

TOPIC: (OJT-General-2) Inspection Documentation

PURPOSE: The purpose of this activity is to familiarize an inspector with the requirements for construction inspection report documentation.

Note: The CIPMS program is still in development and knowledge desire by this ISA can best be obtained by discussion with your supervisor or a designated CIPMS subject matter expert.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 24 hours

REFERENCES: Manual Chapter 0613, "Documenting 10 CFR Part 52 Construction and Test Inspections"

Manual Chapter 0616, "Fuel Cycle Safety and Safeguards Inspection Reports"

Applicable Inspection Procedures

NRC Enforcement Manual Section for Construction Inspection

EVALUATION CRITERIA: Upon completion of the tasks, the inspector should be able to:

1. Generally describe the requirements for documenting construction inspection reports.
2. Demonstrate the ability to properly document inspection findings in accordance with the applicable NRC Enforcement Manual sections.
3. Describe the necessary level of inspection effort applied to an ITAAC item and the needed documentation.

TASKS:

1. Review the references listed above to develop an understanding of the documentation requirements for construction inspections.
2. Organize and incorporate draft inspection report inputs from other inspectors, as applicable.

DOCUMENTATION: General Proficiency Qualification Signature Card Item OJT-General-2

General Proficiency On-the-Job Activity

TOPIC: (OJT-General-3) Inspection Accompaniment

PURPOSE: The purpose of this activity is to familiarize an inspector with a typical construction inspection for a nuclear facility.

COMPETENCY AREA: INSPECTION

LEVEL OF EFFORT: 40 hours

REFERENCES: Applicable Final Safety Analysis Report Sections

Applicable Inspection Procedures and Manual Chapters 2503 and 2504

ITAAC (as applicable)

EVALUATION CRITERIA: Upon completion of the tasks, the inspector should be able to:

1. State the actions required to be taken prior to and during a construction inspection.

2. Identify activities that will occur with regard to your discipline during the performance of a construction inspection.

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

4. Discuss how deficiencies identified during an inspection are documented and handled by the NRC and the licensee.

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 during implementation of the inspection procedures and conduct inspection activities in progress.

2. Review the applicable site inspection schedule, select an upcoming inspection and discuss your participation in the target

inspection with the lead inspector and the Senior Resident Inspector. After approval, begin preparing for the inspection by composing an inspection plan and completing the following tasks.

3. Review the applicable Inspection Procedures to identify the inspection attributes that will be evaluated during the inspection. Discuss any questions with a qualified construction inspector or your supervisor.

4. Review the regulatory requirements with regard to quality assurance contained within 10 CFR 50, Appendix B and the licensee's Quality assurance program.

5. Become familiar with the applicable licensee implementing procedures. Review the applicable requirements from referenced Codes and Standards. Develop an understanding of what is necessary for successful implementation of the item to be inspected.

6. Participate in the inspection entrance meeting.

7. Perform an independent observation of the licensee activities selected for inspection. Observe sufficient activities to reach an independent conclusion on compliance with all applicable requirements. Take care not to interfere with the conduct of the licensee performance. Do not discuss your observations or conclusions during the inspection with the licensee.

8. Discuss your observations and opinions with the lead NRC inspector and provide recommendation on whether the licensee demonstrated satisfactory compliance with all applicable requirements.

9. Participate in the inspection exit meeting.

10. Prepare your report input describing your inspection activities and conclusions and deliver it to the lead inspector.

11. 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: General Proficiency Qualification Signature Card Item OJT General-3

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General Proficiency Level Signature Card and Certification

Inspector Name :_____	Employee Initials/Date	Supervisor's Initials/Date
Training Courses		
100: Effective Communications For NRC Inspectors		
135: Gathering Information For Inspectors through Interview		
E-301: Quality Assurance		
571: Media Training Workshop		
G-105: Conducting Inspections		
G-110: Licensing Reactors under Part 52		
F-201 or F-201S: Fuel Cycle Processes/Directed Self-Study (or ISA-General 13)		
Reactor Technology Overview (one technology only is required)		
New Reactor Technology (a minimum of one design is required)		
Construction Inspection Program Course (G-113)		
Individual Study Activities		
ISA-General-1: Corrective Action Program		
ISA-General-2: Technical and Regulatory Issues		
ISA-General-3: Overview of 10 CFR Part 50 and 52		
ISA-General-4: Overview of 10 CFR Part 40		
ISA-General-5: Overview of 10 CFR Part 70		
ISA-General-6: Overview of 10 CFR Parts 19 and 20		

ISA-General-7: Periodic Assessment of Construction Inspection Program Results		
ISA-General-8: Construction Inspection Program Quality Assurance (QA) and Defect Reporting Requirements		
ISA-General-9: Construction Inspection Program		
ISA-General-10: Design Control Document		
ISA-General-11: Construction Inspection Program Information Management System (CIPIMS)		
ISA-General-12: Industry Codes and Standards - General		
ISA-General-13: Fuel Cycle Process Fundamentals		
ISA-ASME-1: Regulatory Basis for the Requirements Specified in the American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code - (Mechanical Area Inspectors Only)		
ISA-ASME-2: American Society of Mechanical Engineers Boiler & Pressure Vessel Code, Section III (ASME Code, or Section III) Overview - (Mechanical Area Inspectors Only)		
Rotation and On-the-Job Training Activities		
ROT-General-1: Operating Reactor Site		
OJT-General-1: Inspection Entrance/Exit Meetings		
OJT -General-2: Inspection Documentation		
OJT -General-3: Inspection Accompaniment		

Branch Chief's Signature indicates successful completion of all required courses and activities listed in this journal.

Branch Chief's Signature _____ Date: _____

This signature card must be accompanied by a Form 1: General Proficiency-Level Equivalency Justification, if applicable.

Copies to: Inspector
HR office
Branch Chief

Form 1: General Proficiency-Level Equivalency Justification	
Inspector Name: _____	***Identify equivalent training and experience for which the inspector is to be given credit***
Training Courses	
Individual Study Activities	

Form 1: General Proficiency-Level Equivalency Justification	
Inspector Name: _____	***Identify equivalent training and experience for which the inspector is to be given credit***
Rotation and On-the-Job Training Activities	

Branch Chief's Recommendation Signature / Date_____

Division Director's Approval Signature / Date_____

This form must accompany the Signature Card and Certification, if applicable.

Copies to: Inspector
HR Office
Branch Chief

ATTACHMENT 1

Revision History Sheet for IMC 1525 Appendix B

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	02/06/07 CN 07-005	Initial issue of document	NO		
N/A	11/25/08 CN 08-033	Revision to update references, address current policies on training, and make minor editorial corrections.	NO	N/A	ML081260489
N/A	12/07/09 CN 09-031	Revision to add or remove training activities, incorporate references, make editorial corrections, and combine the general proficiency-level with the technical proficiency-level training activities. Revisions are sufficiently extensive to constitute a rewrite. No insertions or change lines will be displayed.	NO	N/A	ML093000545
N/A	ML110470489 04/25/11 CN 11-007	Revision to add and remove activities and references to clarify general qualifications and added ISA-General-13: Fuel Cycle Process Fundamentals.	NO	N/A	ML110480464