INSPECTION PROCEDURE 71111.21A

(DRAFT) ENGINEERING SAFETY PERFORMANCE INSPECTION

Effective Date: 01/01/2026

PROGRAM APPLICABILITY: IMC 2515 A

CORNERSTONE: Initiating Events
Mitigating Systems
Barrier Integrity

INSPECTION BASES: IMC 0308 Attachment 2

SAMPLE REQUIREMENTS:

Sample Requirements		Minimum Baseline Sample Completion Requirements		
Sample Type	Section	Frequency	Sample Size (per site)	Hours per Site
Engineering Safety Performance	03.01	Annual	1 per site	175-210 hours

71111.21A-01 INSPECTION OBJECTIVES

01.01 To assess current engineering performance to maintain risk-significant systems, structures, and components (SSCs) capable of performing their design basis functions under bounding conditions described in the plant design and licensing bases.

01.02 To assess current engineering performance to maintain SSCs defense-in-depth capability with safety margins provided for in the design and licensing bases.

01.03 To provide insights regarding current engineering performance to maintain SSCs consistent with probabilistic risk assessments (PRAs) used for regulatory activities.

71111.21A-02 GENERAL GUIDANCE

This inspection assesses current engineering performance to maintain risk-significant SSCs capable of performing their intended functions under bounding conditions, maintenance of safety margins and provides insights regarding plant fidelity to PRAs.

This inspection procedure (IP) is structured for flexibility, agility and efficiency to inspect current, risk-significant licensee engineering activities. The IP provides flexibility in choosing those engineering activities most warranting focus along with flexible inspector staffing and schedules to efficiently complete reviews that fulfill the inspection objectives.

This IP is intended to be used to implement the technical requirements and guidance in past engineering inspection procedures such as (but not limited to) those listed below:

71111.07	Heat Exchanger/Sink Performance
71111.17T	Evaluations of Changes, Tests and Experiments
71111.18	Plant Modifications
71111.21M	Comprehensive Engineering Team Inspection (CETI)
71111.21N	Design Bases Assurance Inspection – Environmental Qualification (EQ)
71111.21N.02	Power-Operated Valves (POV)
71111.21N.03	Commercial Grade Dedication (CGD)
71111.21N.04	Age-Related Degradation (ARD)
71111.21N.05	Fire Protection Team Inspection (FPTI)
71152	Problem Identification and Resolution (PI&R)

Sample types implemented under this IP will cover several types of samples such as CGD packages, aging-related component reviews, fire protection SSCs and administrative controls, POV design basis evaluations, modifications, 10 CFR 50.59 screenings and evaluations, and operating experience reviews.

Other inspection procedures listed in the NRC Inspection Manual may be referenced for use under this IP including temporary instructions and smart samples. These inspection areas should be based on operating experience, current engineering activities, licensee performance and risk insights. Attachment 2 may be used as a reference.

The referenced IPs provide inspection guidance and technical requirements. The referenced IPs were developed historically with specific sample types, completion requirements, and budgeted inspection hours. Under this IP, inspection plans should be developed to accomplish the referenced IP’s sample activities with the scope scaled to the resource estimate provided in this IP. This will constitute sample completion.

02.01 Background

In 2025 NRC staff changed the engineering inspection program as part of the overall Reactor Oversight Process (ROP) rebaselining efforts (SECY-25-XXXX Recommendations for Rebaselining Inspections in the ROP, ML25xxxxx) which eliminated previous quadrennial engineering team inspections and created this new, smaller, annual team inspection. This inspection is normally completed by two regional based engineering inspectors and a resident inspector. The SSCs selected to make up the sample for this inspection completion will be inspected using other specific IPs, with the compilation of SSCs reviewed under the specific IPs totaling 175hrs.

02.02 Inspection Planning

a. Timely Communication of Inspection Scope with Licensee

In many instances, decisions as to the IP(s) to be accomplished under this IP may have been made as part of the end-of-cycle (EOC) review process described in IMC 0305, "Operating Reactor Assessment Program." If decisions have not been made prior to the inspection planning phase, the branch chief is responsible for the IP selection and timely communication with licensee site management.

To help make IP selection for a particular site, the branch chief may direct the inspection lead to gather information from the licensee describing current engineering activities. If necessary, this activity should commence approximately 180 days and no later than 120 days prior to the scheduled onsite inspection (if inspection scope is known, specific request for information may be sent closer to the inspection date). This can be accomplished by document requests and/or discussions with the site Resident Inspectors. Attachment 1 may be used as a guide for a document request. This step is optional and at the discretion of the responsible branch chief.

The responsible branch chief will provide the inspectors direction as to the IP(s) to be completed. The branch chief will also ensure timely communication with licensee site management as to the IP(s) to be referenced to complete this inspection, approximately 120 days and no later than 90 days prior to start of the onsite inspection.

b. Inspection Planning Flexibility

The resource estimate in this IP provides for an annual inspection of engineering performance by approximately two or three inspectors for up to 2 weeks on site.

While this inspection may initially be completed using a single referenced IP, the structure provides for maximum flexibility. This inspection can be two back-to-back onsite weeks depending on complexity of the inspection samples or the onsite weeks could be spread out over a period of time. There is flexibility to complete more than one referenced IP in a given year as long as the overall effort is planned to be accomplished within the resource estimate hours. For example, two staff members may review POVs for 1 onsite week followed by a three-person effort for 1 onsite week to complete fire protection samples. The efforts may be conducted as a single continuous effort or split into distinct separate weeks during a given year. Alternatively, a particular SSC such as emergency diesel generators may be selected and inspected using both CETI and ARD IPs for 2 consecutive onsite weeks. Annual inspection effort should be planned to be accomplished within the annual budgeted range in this IP.

c. Inspection Plan Documentation – Current Performance Based and Risk Informed

The inspection lead should develop an inspection plan that implements the referenced IP(s) objectives within the resource estimates. Attachment 2 may be used as a reference to build the inspection plan. Referenced IPs contain guidance and requirements for risk informed sample selection. Inspection plans should demonstrate a focus on current licensee engineering performance (last 4 years). Inspection plans should identify the samples selected, staff assignments, and the in-office and/or onsite staff schedule appropriate for the samples and engineering performance attributes. During sample selection, the inspection lead should review prior inspection history and consider selecting a sample that has not been reviewed recently at the site. This approach promotes broader coverage of engineering programs and ensures that all relevant areas receive periodic oversight. The inspection leader should also consider current licensee performance, operating experience, resident inspector input, and risk insights when finalizing sample selections.

The flexibility provided in this IP can result in a variety of risk informed tasks for the inspection lead to accomplish. The following provides guidance:

- In instances where a specific IP is identified to be conducted, the inspection lead should develop an inspection plan and select samples by following the guidance in the referenced IP.

- In instances where specific SSC(s) are identified for review, the inspection lead should develop an inspection plan to review those current engineering activities to maintain the associated SSC functions and the IP(s) best suited to assess performance. Risk insights should be applied to identify those functions and design requirements most relevant to risk for the specified SSC(s). The inspection plan should have sufficient information to assist inspectors to focus on current engineering performance to maintain risk significant SSC functions and design requirements. The Standardized Plant Analysis Risk (SPAR) dashboard and consultation with senior reactor analysts are available for planning. The risk importance measures described in IP 71111.21M, Section 02.02.b, are relevant.

- In instances where the focus is on current engineering activities or work products (last 4 years), the inspection lead assesses the activities/work products in the last 4 years to identify affected SSC(s). Review of the licensee's corrective action program should be applied to identify engineering products implemented as a result of failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances. Additionally, inspectors should use relevant risk insights, such as maintenance rule program basis documents, current licensee risk analysis results or insights, licensee system health reports, and the Plant Risk Information eBook (PRIB) found in the site-specific SPAR model when selecting samples. The inspection lead applies risk insights based on the SSCs. Additionally, IP 71111.21M, Section 02.02.e, further provides sample selection guidance based on complexity and the design, operational, and maintenance margin. The inspection lead should identify the IP(s) most suited to independently assess current engineering activities or work products.

02.03 Inspection Documentation

Inspection results may be documented in either an integrated quarterly inspection report or stand-alone inspection report as directed by the responsible branch chief.

71111.21A-03 INSPECTION REQUIREMENTS

Inspection requirements are provided for in the IPs referenced to be completed under this IP.

71111.21A-04 RESOURCE ESTIMATE

The inspection procedure is estimated to take approximately 175 to 210 hours of NRCs direct inspection resource estimate for an annual inspection of engineering performance. The resource estimate provides for an annual inspection at a site of 175 – 210 hours, which typically represents approximately two to three inspectors for 2 weeks as warranted.

71111.21A-05 PROCEDURE COMPLETION

Inspection of the minimum sample size will constitute completion of this procedure in the Reactor Program System – Inspections. The minimum sample size consists of 1 sample regardless of the number of units at the site.

71111.21A-06 REFERENCES

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

10 CFR 50.2, “Design Basis”

10 CFR 50.59, “Changes, test, and experiments”

10 CFR 50.71, “Maintenance of records, making of reports”

NEI 96-07, “Guidance for 10 CFR 50.59 Implementation,” Revision 1 (Nov. 2000) (ML003771157)

NRC Regulatory Guide 1.187, “Guidance for Implementation of 10 CFR 50.59, Changes, Test, and Experiments,” Revision 2, June 2020 (ML20125A730)

NUREG-1801 Final Report, “Generic Aging Lessons Learned (GALL) Report,” Revision 2 (ML103490041)

END

Attachment 1: Document Request Template – Current Engineering Performance

The following may be requested to help identify areas to focus the inspection. Current engineering performance generally involves activities within the previous 4 years. Inspectors may consult NUREG-1913 for background on licensee engineering products and applicable regulations. After the first annual inspection information request, subsequent requests should only be requesting updated information since the last request.

1. List of calculation titles and document identifiers that have been revised in the last 4 years. Include other information in the listing such as affected systems and quality level that are readily electronically retrievable from licensee databases.

2. List of modification packages implemented in the last 4 years. Include title and document identifier. Also include other information such as affected systems and quality level as readily retrievable.

3. List of temporary modification packages currently installed at the site. Include title and document identifier. Also include other information such as affected systems and quality level as readily retrievable.

4. List of engineering evaluations supporting operability determinations completed in the last 4 years.

5. List of setpoint revisions completed in the last 4 years. Include information such as title, system and document identifier.

6. List of preventive maintenance strategy changes in the last 4 years.

7. List of evaluations completed by engineering staff as input into the corrective action process in the last 4 years. Inspection lead should work with licensee to determine how this can be accomplished efficiently.

8. List of problems entered into the corrective action process involving site engineering in the last 4 years.

9. If applicable to site processes most recent system health reports for top 20 risk ranked systems for site plants.

10. List of risk informed site initiatives supported by engineering staff in the last 4 years.

Attachment 2: Hours Estimate for Reference Inspection Procedure Sample Breakdown

Sample	Hours/Sample*	Complexity
CETI Structures Systems and Components (SSC)	44	High
CETI Modifications/ IP 71111.18 Temporary or Permanent Modification	8-40	Low to High
IP 71111.17T or CETI 50.59 Evaluations/Screening	5	Low
CETI Operating Experience	22	Medium
FPTI SSC's Credited for Fire Prevention, Detection, Suppression, or Post-Fire Safe Shutdown	35	High
FPTI Fire Protection Program (FPP) Administrative Controls	30	High
FPTI FPP Changes	45	High
FEI- ARD	22.5	Medium
FEI- CGD	20	Medium
FEI- POV	22.5	Medium
Design Bases Assurance Inspection- EQ	30	High
IP 71111.07 Heat Exchanger/Sink Performance	7	Low
Heat Exchanger/Sink Performance (CETI Appendix E)	40	High
FLEX EQUIPMENT DESIGN CONTROL, MAINTENANCE, AND TESTING (OpESS 2020/01)	8 -29	Low to Medium
DIGITAL INSTRUMENTATION AND CONTROLS (OpESS 2023/01)	8-40	Low to High

*The ranges and hours are estimates to be used for inspection planning purposes. These hours were based on the reference IPs samples/hr. Hours per component may be adjusted to meet the specifics of the inspection plan.

Sample Complexity	Estimated Hours per Sample
High Complexity	30–45
Medium Complexity	15-29
Low Complexity	5-14

Attachment 3: Draft Inspection Sample Makeup

The inspection plans are intended to be responsive to recent (past 4 year) conditions. To assist inspectors in creating effective sample selection, several concepts of the idea are provided below. These are not intended to limit the scope of what inspectors may use and these examples are guidance for inspection teams to help build their specific inspection plan. Hours per component may be adjusted to meet the specifics of the inspection plan.

Example 1
Plant Performance – Multiple EDG failures

Procedure	Component	Hours
71111.21M (CETI SCC)	EDG 1A	40
71111.21M (CETI SCC)	Unit 1 Service Water	35
71111.21N.04 (ARD)	EDG 1B	20
71111.21N.04 (ARD)	EDG 2A	25
71111.21M (CETI OpE)	IN 2007-18/IN 2007-36	20
71111.21N.05 (FP SSC)	Unit 2 EDGs	35
		175

Example 2
SSC focused review – Diesel Generators/Buses/Batteries

Procedure	Component	Hours
71111.21M (CETI SCC)	Unit 1 EDG A	40
71111.21M (CETI SCC)	Unit 2 2A Bus and Battery	35
71111.21N.04 (ARD)	EDG 1B	20
71111.21M (CETI OpE)	IN XXXX/RIS XXXX	20
71111.21N.05 (FP SSC)	Unit 2 Switchgear Area	35
71111.21N.03 (CGD)	Microswitch 4KV Breaker	20
71111.18 (Mods)	Screen/Eval	5
		175

Example 3
Single Procedure focus using CETI

Procedure	Component	Hours
71111.21M (CETI SCC)	Unit 1 HPCI	35
71111.21M (CETI SCC)	Unit 2 2A DC Bus and Battery	35
71111.21M (CETI SSC)	Unit 1 2A and 2C SRVs	35
71111.21M (CETI SSC)	Unit 2 Service Water	35
71111.21M (CETI Mod)	Digital Feedwater Modification	30
71111.21M (CETI Eval)	Screen 4KV Fast Transfer	5
		175

Example 4
Engineering work products

Procedure	Component	Hours
71111.21M (CETI SSC)	Unit 1 Service Water	40
71111.21M (CETI Mod)	Digital Feedwater Modification	30
71111.21N (EQ Mod)	Unit 2 2B Pressurizer PORV Solenoid Valve	30
71111.21N.05 (Fire Mod)	Diesel Driven Fire Pump Replacement Modification	30
71111.21N.02 (FEI POV)	Shutdown Cooling Suction Isolation Valve	22.5
71152 (PI&R)	Engineering Analysis in support of Operability Determinations	9.5
71111.18 (Temporary Mod)	Substitute Power Range Control Channel Modification	8

71111.21M (CETI Eval)	Screen 4KV Fast Transfer	5
		175

Example 5
Single Procedure Focus on Recent Fire Protection Changes/ Concerns

Procedure	Component/ Programs	Hours
71111.21N.05 (FP SCC)	Unit 1 125 Vdc System	35
71111.21N.05 (FP Fire Area)	Fire Area XX	30
71111.21N.05 (FP Program)	Fire System Impairments/ Allowed OOS Times and Comp Measures	35
71111.21M (FP SSC/ MOD)	Diesel Fire Pump Modification	35
71111.21M (FPP Changes)	2 Risk Significant Program Changes	30
71152 (PI&R)	Follow-up on Recent FP Program Concerns	10
		175

Attachment 4: Revision History for IP 71111.21A

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 Information)
N/A	ML25303A281 10/30/25	Initial Issuance of new Inspection Procedure (IP). These revisions were recommended as a result of the ADVANCE Act 507 Report to Congress that discussed the revision of the ROP Baseline Inspection Program. No commitments found in the area of this IP.	No	N/A