

NRC INSPECTION MANUAL

IRIB

INSPECTION PROCEDURE 71111 ATTACHMENT 24

TESTING AND MAINTENANCE OF EQUIPMENT IMPORTANT TO RISK

Effective Date: January 1, 2023

PROGRAM APPLICABILITY: IMC 2515 Appendix A

CORNERSTONES: Initiating Events
 Mitigating Systems
 Barrier Integrity

INSPECTION BASES: See IMC 0308, "Reactor Oversight Process Basis Document,"
 Attachment 2, "Technical Basis for Inspection Program"

SAMPLE REQUIREMENTS

Sample Requirements		Minimum Baseline Completion Sample Requirements		Budgeted Range	
Sample Type	Section	Frequency	Sample Size	Samples	Hours
Surveillance Testing	03.01	Annual	20 per site*	24 to 38 per site	135 to 148 hours per site 76 to 84 hours at Vogtle Units 3 & 4
Post-Maintenance Testing (PMT)		Annual	14 at Vogtle Units 3 & 4*		
Inservice Testing (IST)		Annual	4 per site 1 at Vogtle Units 3 & 4**		
Containment Isolation Valve (CIV) Testing		As Required**	1 per unit		
Ice Condenser Testing***		As Required**	1 per unit		
Reactor Coolant System Leakage Detection Testing		As Required****	1 per unit		
Diverse and Flexible Coping Strategies (FLEX) Testing	03.02	Annual	1	1 per site, including Vogtle	

*At least 4 of each sample type are required for non-AP1000, and 3 for AP1000

**Required Each Refueling Outage

***Only applicable to Ice Condenser Units

****Required when monitoring for increasing reactor coolant leakage occurs

71111.24-01 INSPECTION OBJECTIVE

- 01.01 To verify that surveillance testing, including IST activities, provides objective evidence that risk- or safety significant structures, systems, and components (SSCs) remain capable of performing their intended safety function and maintain their operational readiness consistent with their design and licensing bases.
- 01.02 To verify that PMT procedures and testing activities adequately verify system operability and functionality after the completion of maintenance.
- 01.03 To verify that testing activities provide objective evidence that FLEX SSCs remain capable of performing their intended functions and maintain their operational readiness consistent with their design and licensing bases.

71111.24-02 GENERAL GUIDANCE

Select a reasonable distribution of surveillance and PMT samples each quarter, and on each unit at multi-unit sites throughout the year. This approach will guarantee that at least 4 of each sample type are conducted. An increase in sample selection during maintenance and refueling outages may be appropriate based on-site activities and priorities.

Select surveillance and PMT samples that are associated with risk-significant SSCs. Also, select risk-significant SSCs with recent performance issues, SSCs in which maintenance activities have been recently completed, and SSCs with complex maintenance programs. Surveillance tests may be observed for PMT; however, the inspection may not be counted as both a surveillance sample and a PMT concurrently.

Verification of activities under this procedure should focus on performance-based field observations of complete surveillance and PMT evolutions, followed by verification of the bases and of the proper demonstration of performance that supports operability and/or functionality determinations.

During maintenance and refueling outages, focus on infrequently performed surveillance tests; particularly large-scale actuation tests, full-flow risk-significant pump testing, and inspections of normally inaccessible SSCs (e.g., containment sump inspections, refueling water storage tank or condensate storage tank internal inspections). Also, complete the CIV testing and, if applicable, the Ice Condenser Testing.

Also consider reviewing surveillance testing activities in which there was a modification of the surveillance frequency that was accomplished through the Risk Management Technical Specification (TS) Initiative 5b, "Surveillance Frequency Control Program."

For plants that have implemented the requirements of 10 CFR 50.69, sample selection should include consideration of SSCs that have been categorized as non-safety-related SSCs that perform safety significant functions (i.e. RISC-2). Refer to IP 37060, "10 CFR 50.69 Risk-Informed Categorization and Treatment of Structures, Systems, and Components Inspection," for additional information.

In addition, if the Reactor Coolant System (RCS) is being monitored by the licensee due to performance degradation (i.e., increasing RCS leakage), include RCS leakage detection surveillance testing as part of the inspection sample (See section 03.01.15).

When selecting an IST activity for inspection, consider whether the component or system has had known deficiencies, or if corrective or preventive maintenance had recently been performed.

For sites that have Lead Test Assemblies (LTAs) loaded in operating cores, consider selecting a sample to verify that the RCS Specific Activity is within regulatory limits. NRC memorandum, "Clarification of Regulatory Path for Lead Test Assemblies," ([ML18323A169](#)) contains additional background information.

For AP 1000 designs, in addition to SSCs, focus on systems classified as regulatory treatment of non-safety systems (RTNSS) of high or intermediate importance, which are used for protecting utilities investment and for preventing and mitigating severe accidents. A list of SSCs classified as RTNSS is included in table 16.3-1 of chapter 16 of the Vogtle Electric Generating Plant (VEGP) Updated Final Safety Analysis Report (UFSAR). The list of Risk-Significant SSCs within the Scope of Design Reliability Program, which evaluates the design of the AP 1000 and identifies the aspects of plant operation, maintenance, and performance monitoring pertinent to risk-significant SSCs, is in chapter 17 of the VEGP UFSAR, table 17.4-1. RTNSS is discussed in section C.IV.9 "Regulatory Treatment of Nonsafety Systems" of Regulatory Guide 1.206, "Applications for Nuclear Power Plants."

Following the events at Fukushima, the NRC ordered every U.S. commercial reactor to develop mitigation strategies for addressing the long-term loss of normal safety systems following the occurrence of a beyond-design-basis external event (NRC Order EA-12-049, ML12054A735). Because of the low probability of an external event causing a simultaneous loss of all alternating current (AC) power and normal access to the ultimate heat sink, FLEX equipment may not be risk- or safety-significant. However, the availability of FLEX equipment increases defense-in-depth for beyond-design-basis events to address a simultaneous loss of AC power the ultimate heat sink at all units at a site.

Implementation guidance for FLEX is found in Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," and endorsed via Japan Lessons Learned Project Directorate Interim Staff Guidance (JLD-ISG) 2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events." Various revisions are in effect. NEI 12-06, Revision 0 (ML12242A378) is endorsed via JLD-ISG 2012-01, Revision 0 (ML12229A174). NEI 12-06, Revision 2 (ML15348A015) is endorsed via JLD-ISG 2012-01, Revision 1 (ML15357A163). NEI 12-06, Revision 4 (ML16354B421) is endorsed via JLD-ISG 2012-01, Revision 2 (ML17005A188). It should be noted that not all revisions of NEI 12-06 are endorsed.

Following the events at Fukushima, the NRC also ordered licensees with Mark I and Mark II BWR containment designs to install a hardened containment vent system (HCVS) (NRC Order EA-13-109, ML13143A321). Should issues with FLEX be identified at such sites, the inspectors should consider performing a surveillance testing sample of the HCVS to ensure that any required periodic testing is being adequately performed.

Implementation guidance for HCVS is found in NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109." Various revisions are in effect and address different aspects of the order. NEI 13-02, Revision 0 (ML13316A853) is endorsed by JLD-ISG-2013-02 (ML13304B836) and NEI 13-02, Revision 1 (ML15113B318) is endorsed via JLD-ISG-2015-01 (ML15104A118).

For each sample, conduct a routine review of problem identification and resolution activities using IP 71152, "Problem Identification and Resolution." Inspectors should also follow-up on

issues that could have impacted previous testing, such as measuring and test equipment (M&TE) that fails a calibration check. The inspectors should assess whether the licensee documents the testing that the failed M&TE supported, compares the failed M&TE calibration data with the results of each test that used the faulty M&TE, and then assesses the impact to the operability of the affected system. The inspectors should also consider performing IP 71111.15, "Operability Determinations and Functionality Assessments," to more thoroughly assess the potential impact of the failed M&TE on the operability of the affected system.

The following table outlines additional inspection guidance for selecting inspection samples for review.

Cornerstone	Inspection Objective	Risk Priority	Examples
Mitigating Systems	Identify any mitigating system credited by the licensee as operable, which is adversely impacted by the failure to adequately test, the failure to meet test criteria, or the failure to realign equipment after testing or maintenance	<p>Focus in areas with the potential for common mode failures or systems with a risk achievement worth (RAW)¹ greater than or equal to 1.3</p> <p>Select activities with a recent record of maintenance or testing errors</p> <p>Select activities with overlapping technical disciplines (electrical, mechanical, I&C)</p> <p>Select activities that have had a recent change in work scope or experienced problems</p> <p>IST of pumps and valves that perform important functions in mitigating systems²</p> <p>Locations containing cables whose failure due to moisture-induced damage could disable risk-significant equipment</p>	<p>Integrated safeguards testing; Emergency diesel generator (EDG) start/load testing</p> <p>Battery performance testing</p> <p>Reactor protection, RCS leakage detection, and safety injection instrumentation testing</p> <p>Safety bus loss of voltage and degraded voltage relay testing</p> <p>Pumps that provide injection water flow and valves that change position to provide injection water flow to the reactor coolant system</p> <p>Normally inaccessible or underground power cables that support EDGs, offsite power, emergency service water, service water, component cooling water, or other risk-significant systems</p>

Cornerstone	Inspection Objective	Risk Priority	Examples
Barrier Integrity	<p>Identify any containment integrity supporting system credited by the licensee as operable, which is adversely impacted by the failure to adequately test, the failure to meet test criteria, or the failure to realign equipment after testing or maintenance</p> <p>Aging effects could result in an increased likelihood of failures in passive components and increased containment leakage</p>		<p>Containment isolation valve testing; Ventilation and filtration system testing; Ice Condenser Testing</p> <p>Containment air lock leakage testing</p> <p>Local leak rate testing and containment integrated leak rate testing</p>

RAW is defined in NUREG-2122, "Glossary of Risk-Related Terms In Support Of Risk-Informed Decisionmaking."
For additional guidance on IST inspection refer to IP 73756, "In-service Testing of Pumps and Valves" and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

71111.24-03 INSPECTION SAMPLES

03.01 Surveillance Testing and PMT Samples

- a. **Verify by witnessing surveillance tests and/or reviewing the test data that surveillance testing activities and results provide objective evidence that the affected SSCs remain capable of performing their intended safety functions under conditions as close as practical to design bases conditions or as required by TS and maintain their operational readiness consistent with the facility's current licensing basis.**

Specific Guidance

For each surveillance testing activity selected perform the following:

1. Determine whether the effect of the surveillance testing on plant operations has been adequately addressed by licensee personnel.
2. Determine whether unacceptable preconditioning of SSCs prior to or following testing occurred. Unacceptable preconditioning is the alteration, variation, manipulation, or adjustment of the physical condition of an SSC before or during TS surveillance or American Society of Mechanical Engineers (ASME) Code testing such that it will alter one or more of an SSC's operational parameters, which results in acceptable test results. Such changes could mask the actual as-found condition of the SSC and possibly result in the inability to verify the operability of the SSC. In addition, preconditioning could make it difficult to determine whether the SSC will perform its

intended safety function during a design basis event. Inspection Manual Part 9900, Technical Guidance, “Maintenance – Preconditioning of Structures, Systems, and Components Before Determining Operability,” includes additional guidance that should be consulted when pre-conditioning concerns are identified.

3. Verify that testing acceptance criteria are properly developed from technical bases, such as the design bases, setpoint calculations, UFSAR, and TS Bases, and demonstrate operational readiness consistent with the facility’s current licensing basis (CLB).
4. Confirm that M&TE specified in procedures are part of the M&TE program, their calibration status is within acceptable limits, and their range and accuracy is consistent with the application as supported by design bases documents. Verify that plant equipment calibration is correct, accurate, properly documented, and the calibration frequency is in accordance with the TSs, the UFSAR, licensee procedures, and licensee commitments.
5. Ensure that the surveillance testing is performed in sequence and in accordance with written procedure.
6. Radiation controls, if needed, have been implemented as outlined in the applicable Radiation Work Permit.
7. Determine whether jumpers that are installed or leads that are lifted during the surveillance testing are properly controlled.
8. Verify that electrical connections are properly torqued, secure, and maintain their intended design function.
9. For cases where the licensee relies on multiple surveillance tests to satisfy a surveillance requirement, verify that the affected surveillance testing procedures collectively accomplish the entire scope of the surveillance requirement.
10. Determine whether setpoints, required testing accuracy, testing frequency, and allowable setpoint drift for selected safety-related instrumentation and control surveillance tests (i.e., reactor protection system (RPS), nuclear instrumentation (NIs), etc.) conform to applicable setpoint calculations. Also determine whether reference setpoint data has been accurately incorporated into the applicable test procedure(s). *To determine whether open phase condition (OPC) detection and protection circuits (as applicable) are functional, review OPC alarm setpoints and alarm response procedure(s) to verify whether operators can take timely manual actions consistent with the licensee’s commitments to the OPC Voluntary Industry Initiative.* [C2]
11. Verify that annunciators and other alarms are demonstrated to be functional and setpoints are consistent with design bases documents. Also verify that alarm response procedure entry points and actions are consistent with plant design and/or licensing bases documents.
12. Ensure that testing methods, acceptance criteria, and required corrective actions for IST activities meet the applicable section of the ASME Operation and Maintenance of Nuclear Power Plants (OM Code). Review reference values or changes to

- reference values for consistency with the design bases and verify that the current acceptance criteria is supported by the most recent reference test data. For pump testing, verify that the licensee has established system operating conditions that reflect limiting operational conditions and are sufficiently repeatable to allow performance trending. Also, review sufficient testing performance history to verify that the licensee has identified and is addressing any adverse trends.
13. For local leak rate testing, verify that isolation valves inside and outside containment are each tested with pressure exerted in a direction consistent with expected accident conditions. Also, verify that the licensee updates the total containment leak rate data with the new measured value and confirms that the overall leak rate remains within acceptable limits. Verify that the licensee schedules an isolation valve for maintenance if administrative limits are exceeded. Also verify that a containment penetration is declared inoperable if an acceptance criteria is exceeded.
 14. Verify that the testing frequency is adequate to demonstrate operability and reliability. Appendix A, "Risk Management TS Initiative 5b Surveillance Frequency Control Program," provides additional guidance if a selected sample is associated with the application of the Risk Management TS Initiative 5b Surveillance Frequency Control Program.
 15. *If an adverse trend in RCS leakage is being monitored by the licensee, the inspectors should verify that the licensee has programs and processes in place to (1) monitor plant-specific instrumentation that could indicate potential RCS leakage, (2) meet existing requirements related to degraded or inoperable leakage detection instruments, (3) use an inventory balance check when there is unidentified leakage (4) take appropriate corrective action for adverse trends in unidentified leak rates, and (5) pay particular attention to changes in unidentified leakage. [C1]*
 16. Determine whether the unavailability of the tested equipment is appropriately considered in the licensee's Mitigating System Performance Index (MSPI) data.
 17. After completion of testing, ensure that the equipment is returned to the position or status required for the SSC to perform its intended safety function.
 18. Determine whether testing equipment was removed after the testing is complete.
 19. Ensure that the testing data is complete, verified, and meets all licensee procedural requirements
 20. For test results that do not meet the acceptance criteria, determine whether the results of licensee engineering evaluations provides an acceptable basis for returning the affected SSCs to an operable status.
 21. Review performance trends for the last several completed surveillance tests and determine whether the testing results are appropriately documented and whether any identified issues are properly addressed. If testing indicates unacceptable setpoint drift or otherwise demonstrates degradation, assess the adequacy of the licensee's corrective actions. These may include component replacement and/or increased frequency of testing, for example.

22. *If this IP is being exercised as a result of a failed surveillance test, or if the observed surveillance test was a failure, consider whether the failure could be the result of a counterfeit, fraudulent, and suspect items (CFSI) issue and perform additional inspection accordingly. [C2]*

b. Verify by witnessing PMT activities and/or reviewing completed test data that PMT procedures and testing activities adequately verify system operability and functionality.

Specific Guidance

1. For each testing activity selected, identify the affected system(s), component(s), or both and perform the following:
 - (a) Review the applicable licensing-basis and design -basis documents to identify the safety functions and functions important to safety for the affected systems and components, as appropriate.
 - (b) Review applicable corrective action and maintenance documents.
 - (c) Discuss the maintenance activity with plant personnel to identify potential maintenance errors that could impact the safety function(s) of the equipment.
 - (d) As time permits, observe the associated maintenance activity and identify maintenance errors that could impact the safety function(s) of the equipment.
 - (e) Review the licensee's test procedure, completed maintenance activities, and work orders to verify the following:
 - (1) The procedure adequately tests the safety function(s) and function(s) important to safety that completed maintenance activities could have affected.
 - (2) Acceptance criteria in the procedure are consistent with information in the applicable licensing-basis and design-basis documents or appropriate standards.
 - (3) The procedure has been properly reviewed and approved.
 - (4) As applicable, operations ensured adequate fill and vent for portions of safety systems potentially drained during the maintenance activity.
2. Observe prejob briefs, testing, and post-test critiques if time permits. Review the completed test procedure and data, perform a walkdown of the affected work site, and verify the following:
 - (a) The performance of the affected system(s) and component(s) satisfies the procedure's acceptance criteria.
 - (b) The scope of the test and its acceptance criteria provide reasonable assurance of system operability or functionality considering the scope of work. For example, the residual heat removal (RHR) system functions under a wide range of

pressures. As applicable for the work performed, does the licensee perform the PMT at the highest reasonable pressure for the RHR system component?

- (c) The effects of testing on the plant have been adequately addressed.
 - (d) Radiation controls, if needed, have been implemented as outlined in the applicable Radiation Work Permit
 - (e) Test equipment is calibrated and is within its current calibration cycle.
 - (f) The test equipment used is within its required range and accuracy.
 - (g) Applicable prerequisites described in the test procedure are satisfied.
 - (h) Affected systems or components are removed from service in accordance with approved procedures.
 - (i) The test is performed in accordance with the test procedure and other applicable procedures. For example, during filling and venting operations, look and listen for potential signs of water hammer following pump starts, valve manipulations, or both. Following testing, review operating logs, PMT work orders, and corrective action condition reports for potential adverse conditions caused by the system water hammer. Perform walkdowns to independently verify this condition when appropriate.
 - (j) Quality control hold points that are used to verify quality attributes that cannot be verified later were properly performed, second checked, and documented as appropriate.
 - (k) Jumpers that are installed and leads that are lifted during testing are appropriately controlled, restored, and removed.
 - (l) Test equipment is removed after testing.
 - (m) Electrical connections are secure and maintain their intended design function.
 - (n) After testing is completed, equipment is returned to the positions/status required to maintain the system in an operable or functional condition in accordance with approved procedures.
 - (o) Enclosures, seals, shielding, and protective features are appropriately restored.
 - (p) Work site cleanliness is maintained. Tools, rags, and other debris are not left adrift where they may impede required system, component, or operator functions.
 - (q) Problems noted during testing are appropriately documented.
3. *If this IP is being exercised because of a failed post-maintenance test, or if the observed post-maintenance test was a failure, consider whether the failure could be the result of a CFSI issue and perform additional inspection accordingly. [C2]*

4. For each testing activity sampled, review the licensee's completed test results, completed maintenance activities, and work orders after the system or component has been declared operable or considered functional to verify the following:
 - (a) The PMT results are accurate, complete, and valid and have been properly reviewed and accepted.
 - (b) The PMT adequately tested the safety function(s) and function(s) important to safety considering all completed maintenance activities. Specifically, consider those maintenance activities that could have subsequently disabled functions after completion of the PMT or created the need to perform additional testing.

03.02 FLEX Testing

Verify by witnessing tests and/or reviewing the test data, that testing activities and results provide objective evidence that FLEX SSCs remain capable of performing their intended functions (under conditions as close as practical to licensing conditions) and maintain their operational readiness consistent with the facility's current licensing basis.

Specific Guidance

Section 11.5 of NEI 12-06 contains guidance on FLEX maintenance and testing. In addition, while formal test acceptance criteria may not be required, inspectors can reference the licensee's Final Integrated Plan to gain an understanding of the credited function for the FLEX equipment that licensees should be validating during periodic FLEX testing. If needed, questions regarding FLEX issues can be raised with either the regional Technical Support Branch Chief or with the NRR Beyond Design Basis Engineering Branch (via the NRR DORL PM).

71111.24-04 REFERENCES

10 CFR 50, Appendix J, including Option B.

ASME Operation and Maintenance of Nuclear Power Plants, Division 1, OM Code: Section IST Bulletin 88-04, "Potential Safety Related Pump Loss," May 5, 1988.

Code of Federal Regulations, Title 10, Part 50, Section 50.55a, "Codes and Standards."

Cross Reference of Generic Communications to IPs and Inspection Resources:
<https://intranet.nrc.gov/nrr/ope/33953> (nonpublic)

Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," April 3, 1989.

IHS Codes and Standards: <https://intranet.nrc.gov/tech-lib/35744> (nonpublic)

IMC 2515, "Light-Water Reactor Inspection Program - Operations Phase"

IMC 2515, Appendix A, "Risk-Informed Baseline Inspection Program"

IMC 0308, Attachment 2, "Technical Basis for Inspection Program"

Information Notice 2010-25, "Inadequate Electrical Connections"

Information Notice 97-90, "Use of Nonconservative Acceptance Criteria in Safety Related Pump Surveillance Tests," December 30, 1997

IP 37060, "10 CFR 50.69 Risk-Informed Categorization and Treatment of Structures, Systems, and Components Inspection"

IP 61720, "Containment Local Leak Rate Testing"

IP 71111.12, "Maintenance Effectiveness"

IP 71152, "Problem Identification and Resolution"

IP 73756, "Inservice Testing of Pumps and Valves"

JLD-ISG 2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," ([ML12229A174](#))

JLD-ISG 2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," ([ML15357A163](#))

JLD-ISG 2012-01, Revision 2, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," ([ML17005A188](#))

NEI 00-04, "10 CFR 50.69 SSC Categorization Guideline," Nuclear Energy Institute, Washington, DC, July 31, 2005. ([ML052900163](#))

NEI 04-10 Revision 0 1, Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document ([ML062570416](#))

NEI 04-10 Revision 1, Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document ([ML071360456](#))

NEI 12-06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," ([ML12242A378](#))

NEI 12-06, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," ([ML15348A015](#))

NEI 12-06, Revision 4, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," ([ML16354B421](#))

NRC Memorandum "Clarification of Regulatory Path for Lead Test Assemblies," ([ML18323A169](#))

NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants"

NUREG-2122, "Glossary of Risk-Related Terms In Support Of Risk-Informed Decision-making"

OIG-22-A-06, "Audit of the Nuclear Regulatory Commission's Oversight of Counterfeit, Fraudulent, and Suspect Items at Nuclear Power Plants," February 9, 2022

Operating Experience: <https://intranet.nrc.gov/nrr/ope/33953> (nonpublic)

Regulatory Guide (RG), 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems"

Regulatory Issue Summary 06-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, Technical Specifications, Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels"

RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," U.S. Nuclear Regulatory Commission, Washington, DC. ([ML090410014](#))

RG 1.201 "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants according to Their Safety Significance," U.S. Nuclear Regulatory Commission, Washington, DC. ([ML061090627](#))

Technical Guidance, "Maintenance - Preconditioning of Structures, Systems Inspection, and Components Before Determining Operability"

END

Appendix A: Risk Management Technical Specifications (TS) Initiative 5b Surveillance
Frequency Control Program (SFCP) Guidance

71111.24A-01 INSPECTION OBJECTIVE

The objective of this appendix is to provide additional guidance if a selected sample is associated with a licensee's implementation of the risk management TS (RMTS) Initiative 5b, described in the RMTS Guidelines Document NEI 04-10, Risk Informed Method for Control of Surveillance Frequencies.

71111.24A-02 GENERAL GUIDANCE

A highlight of the SFCP change process is found in the specific guidance below. The SFCP change process does allow for extending Surveillance Test Intervals (STIs) even when SSCs have had prior failures. However, focus should be placed on previous SSC performance.

The surveillance frequency should be adequate to demonstrate operability. As indicated in Surveillance Requirement (SR) 3.0.1, SRs shall be met during the Modes or other specified conditions in the Applicability for individual Limited Conditions for Operations, unless otherwise stated in the SR. A Surveillance is met only when the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being performed, constitutes a Surveillance not met. Given an SSC's previous performance, the Surveillance will still need to be met during the extended STI. Any concerns associated with extending STIs given prior SSC performance can be raised with NRR/DRO/IRIB.

71111.24A-03 INSPECTION SAMPLES

See section 03.01 of IP 71111.24.

Specific Guidance:

The following guidance highlights the SFCP change process, as recommended in NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document" (see list of References for the applicable revision).

If the STI was previously extended through the SFCP, a minimum number of surveillance intervals is needed per the NEI guidance prior to further extending the STI. A minimum of three successive satisfactory performances of the surveillance is needed when the STI is less than or equal to six months, and a minimum of two successive satisfactory performances of the surveillance is needed when the STI is greater than six months.

Surveillance frequency change was evaluated by the licensee for prohibitive commitments, and either no such commitments existed, or they were revised prior to implementation of the STI change.

The qualitative evaluation by the licensee included, as a minimum, the items identified in NEI 04-10, step 7. Some of the items identified include considerations for SSC performance history, vendor specified maintenance frequency, and test intervals specified in applicable industry codes and standards.

If the affected component or system is modeled in the PRA, or was added to the PRA model to support application of the SFCP: The acceptance criteria for licensee's evaluation, using the licensee's PRA model, is $<1 \text{ E-6 } \Delta\text{CDF}$ and $<1 \text{ E-7 } \Delta\text{LERF}$. If the affected component or system is not modeled in the PRA: The acceptance criteria for the licensee's qualitative or bounding analyses is the acceptance criteria of $<1 \text{ E-7 } \Delta\text{CDF}$ and $<1 \text{ E-8 } \Delta\text{LERF}$. The acceptance criteria for the cumulative impact of all STI changes is $<1 \text{ E-5 } \Delta\text{CDF}$ and $<1 \text{ E-6 } \Delta\text{LERF}$. Sensitivity studies associated with the revised STI are performed by the licensee. An in-depth review of the licensee's PRA evaluation or analysis is not required.

An Independent Decision-making Panel (IDP) approves the STI change. The IDP is comprised of the site Maintenance Rule Expert Panel, a Surveillance Test Coordinator, and a Subject Matter Expert. If approved, the STI changes are appropriately implemented by revising plant procedures and affected documents, and training personnel as needed. SSC performance associated with the revised STI is also monitored by the licensee. SSC performance is considered during periodic re-assessments.

71111.24A-04 REFERENCES

EPRI 1009474, Dec 2004 RMTS Guidelines.

GDC in 10 CFR Part 50, Appendix A.

IMC 2515, Appendix A, "Risk-Informed Baseline Inspection Program"

IMC 0308, Attachment 2, "Technical Basis for Inspection Program"

IP 71111.13, Maintenance Risk Assessments and Emergent Work Control

Licensee Safety Evaluation Report (SER) for the license amendments adopting RITS 5b.

NEI 00-04, Revision 0, 10 CFR 50.69 SSC Categorization Guideline ([ML052900163](#)).

NEI 04-10 Revision 0¹, Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document ([ML062570416](#)).

NEI 04-10 Revision 1, Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document ([ML071360456](#)).

NUMARC 93-01, NEI – Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 3.

RG 1.174, An Approach for Using Probabilistic Risk Assessment in Risk Informed Decisions on Plant Specific Changes to the Licensing Basis.

RG 1.177, An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications.

¹ NEI 04-10, Revision 0, is referenced in the Limerick Generating Station technical specification surveillance frequency control program. All other licensees reference NEI 04-10, Revision 1.

RG 1.200, An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk Informed Activities.

END

Attachment 1: Revision History for IP 71111.24

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)
<p>C1 Reference: Davis-Besse Lessons Learned Task Force Item 3.2.1(3)</p> <p>C2 Reference: Audit of the NRC's Oversight of Counterfeit, Fraudulent, and Suspect Items at Nuclear Power Reactors OIG-22-A-06 Recommendation 6</p>	<p>ML22115A187 08/01/22 CN 22-015</p>	<p>Initial issuance to consolidate IP 71111.19 and IP 71111.22. Guidance associated with Hardened Containment Ventilation System (HCVS); cable degradation; and counterfeit, fraudulent, and suspected items (CFSI) inspections was also added.</p> <p>IP 71111.22 (ML041340229) revised to include RCS leak detection system surveillance as part of the surveillance testing samples. Revision also includes surveillance testing attributes for reviewing annunciator/alarm setpoints and alarm response procedure actions. DBLLTF Report: ML022760172</p> <p>On February 9, 2022, OIG-22-A-06, "Audit of the Nuclear Regulatory Commission's Oversight of Counterfeit, Fraudulent, and Suspect Items at Nuclear Power Plants," was issued. The report identified that the NRC should improve its oversight of Counterfeit, Fraudulent, or Suspected Items (CFSI) by clarifying and communicating how the agency collects, assesses, and disseminates information regarding CFSI, and by improving staff awareness of CFSI and its applicability to reactor inspections. NRC reply: ML22077A775</p>	<p>No</p>	<p>ML22116A130</p> <p>FBF 71111.22-2458 ML22175A064</p>