PLANT MODIFICATIONS

Effective Date: January 1, 2025

PROGRAM APPLICABILITY: IMC 2515 A

CORNERSTONES: Initiating Events
Mitigating Systems
Barrier Integrity

INSPECTION BASES: See IMC 0308 Attachment 2

SAMPLE REQUIREMENTS:

Sample Requirements		Minimum Baseline Completion Sample Requirements		Budgeted Range	
Sample Type	Section	Frequency	Sample Size	Samples	Hours
Temporary Modifications	03.01	Annual	2 temporary and/or permanent modifications per site[1] 2 at Vogtle Units 3 & 4	2 to 6 samples per site[1] 2 to 3 at Vogtle Units 3 & 4	16 to 48 hours per site[1] 18 to 27 hours at Vogtle Units 3 & 4
Permanent Modifications	03.02	Annual			
Severe Accident Management Guidelines (SAMG) Update	03.03	As Required*	1		

*Applicable when the requirements of section 03.03 have been met

71111.18-01 INSPECTION OBJECTIVE

01.01 To verify that modifications have not affected the safety functions of important safety systems.

[1] Also applicable to Vogtle Units 1 & 2

01.02 To verify that the design bases, licensing bases, and performance capability of risk significant structures, systems, and components (SSCs) have not been degraded through modifications.

01.03 To verify that modifications performed during increased risk-significant configurations do not place the plant in an unsafe condition.

01.04 To verify that a site's SAMGs have been updated when either the Boiling Water Reactor Owners' Group (BWROG) or the Pressurized Water Reactor Owners' Group (PWROG) revise generic severe accident technical guidelines.

71111.18-02 GENERAL GUIDANCE

NOTE: Potential issues regarding the impact that changes have on Emergency Preparedness and Security (including Cyber Security) should be raised and addressed under their respective Inspection Programs.

Regulatory Guide (RG) 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Test, and Experiments," states that Revision 1 of Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," provides methods that are acceptable to the NRC staff for complying with the provisions of 10 CFR 50.59. NEI has also published NEI 96-07, Revision 1, Appendix E, "User's Guide for NEI 96-07, Revision 1, Guidelines for 10 CFR 50.59 Implementation." However, NEI 96-07, Revision 1, Appendix E, has not been reviewed or endorsed by the NRC. If needed, questions regarding potential 10 CFR 50.59 issues as a result of a licensee's use of Appendix E can be raised with the DORL PM.

The review of the design aspects of the modification should focus on conformance to relevant design criteria, not the programmatic elements of licensee programs. See Table A, "Inspection Guidance for Parameters Affected by Modification" for additional guidance. Consider inspecting only those parameters which are significant for the particular modification being reviewed. Also, consider informing the regional senior reactor analyst if the plant modification added or deleted functions that could affect the plant specific significance determination process.

Table A – Inspection Guidance for Parameters Affected by Modification

Affected Parameter	Inspection Considerations
Energy Needs: • Electricity • Steam • Fuel + Air • Air	Energy requirements supplied by supporting systems when required under accident/event conditions. Energy requirements of modified SSCs will not deprive other SSCs of required energy under accident/event conditions.

Affected Parameter	Inspection Considerations
Materials/ Replacement Components: • Material Compatibility • Functional Properties • Environmental Qualification • Seismic Qualification • Classification	Materials/replacement components are compatible with physical interfaces. Material/replacement component properties serve functional requirements under accident/event conditions. This includes potential post loss-of-coolant accident (LOCA) debris sources and blockage mitigation. Materials/replacement components are environmentally qualified for application. Replacement components are seismically qualified for application. Code and safety classification of replacement SSCs is consistent with design bases. Replacement schedule consistent with inservice/equipment qualification life. New SSCs added to the plant have been reviewed for inclusion in the maintenance rule scope.
Timing: • Sequence • Response Time • Duration	Sequence changes are bounded by accident analyses and loading on support systems are acceptable. SSC response time is sufficient to serve accident/event functional requirements assumed by design analyses. Modified SSC response time does not cause an unintended interaction with other SSCs. Equipment will be able to function for the duration required under accident/event conditions.
Heat Removal	Heat removal requirements will be addressed by support systems under accident/event conditions.
Control Signals: • Initiation • Shutdown • Control • Logic / Interlocks	Control signals will be appropriate under accident/event conditions.

Affected Parameter	Inspection Considerations
Equipment Protection: • Fire • Flood • Missile • High Energy Line Break • Freeze	Equipment protection barriers and systems have not been compromised.
Operations	Affected operation procedures and training have been identified and necessary changes are in process. Plant simulator has been updated as required. Annunciator and alarm response updated as required.
Flowpaths	Revised flowpaths serve functional requirements under accident/event conditions.
Pressure Boundary	Pressure boundary integrity is not compromised.
Ventilation Boundary	Changes to ventilation boundaries do not increase risk of spreading contamination. Changes to ventilation boundaries do not adversely affect functionality of ventilation system under accident/event conditions.
Structural	Modified SSCs structural integrity acceptable for accident/event conditions. Modified SSCs structural effects upon attachment points acceptable. Modified SSCs effect on seismic evaluations acceptable.
Process Medium: • Fluid Pressures • Fluid Flowrates • Voltages • Currents	Affected process medium properties will be acceptable for both modified SSCs and unmodified SSCs under accident/event conditions.
Licensing Basis: • 10 CFR 50.59	Necessary Technical Specification (TS) changes have been identified and NRC approvals, if required, were obtained prior to modification implementation. Acceptable licensee conclusions for those modifications where evaluations in accordance with 10 CFR 50.59 were not performed.
Failure Modes	Those failure modes introduced by the modification are bounded by existing analyses.

Probabilistic Risk Assessment (PRA): • ASME Code Case N-752 • 10 CFR 50.69 • TS Surveillance Frequency Control Program (SFCP) • TS Risk-Informed Completion Time (RICT)	The PRA model is appropriately updated to reflect plant modifications. Note: A regional senior reactor analyst may be contacted if support is needed.

For each sample, conduct a routine review of problem identification and resolution activities using IP 71152, "Problem Identification and Resolution."

Licensees implemented a voluntary industry initiative (ADAMS Accession No. ML19163A176) to address potential open phase condition concerns identified in Bulletin 2012-01, "Design Vulnerability in Electric Power System" (ADAMS Accession No. ML12074A115) that included either an automatic protection system or manual operator monitoring and actions. If available, licensee modifications to either the automatic protection systems or control room monitoring systems should be selected as samples. [C1]

71111.18-03 INSPECTION SAMPLES

NOTES:

1. Inspectors shall use risk informed insights together with other factors, such as engineering analysis and judgment, and performance history, to determine which temporary and permanent modifications will be selected for review.

2. NEI 96-07, Revision 1, Appendix E, shall not be used by NRC staff in evaluating compliance with the provisions of 10 CFR 50.59.

Additional guidance associated with 10 CFR 50.59 can be found in IMC 0335, "Changes, Tests, and Experiments."

03.01 Temporary modifications.

a. Review the temporary modifications and associated 10 CFR 50.59 screening against the system design bases documentation, including Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TS). Verify that the modifications have not affected system operability/availability.

b. Verify that the installation of the temporary modifications (if accessible) are consistent with the modification documents. Also, if applicable, verify restoration of the temporary modification (if accessible).

c. **Verify configuration control of the modification is adequate by verifying that the plant documents, such as drawings and procedures are updated including adequacy of operating and maintenance procedures.**

d. **Verify that temporary modifications are identified on Control Room drawings and appropriate tags are placed on equipment being affected by the temporary modifications.**

e. **Review post-installation test results to confirm that the tests are satisfactory and the actual impact of the temporary modifications on the permanent systems and interfacing systems have been adequately verified by test. Also, if applicable, review planned testing after removal of the temporary modifications.**

Specific Guidance

Preference should be given to reviewing modifications as they occur and that occur during at power operations or increased shutdown risk configurations. Selected temporary modifications may include jumpers, lifted leads, temporary systems, repairs, design modifications and procedure changes which can introduce changes to plant design or operations. Although the focus of this inspection is on active modifications, inspectors may choose to review a recently removed temporary modification for adequate restoration and testing. See Table B, "Sample Selection of Temporary Modifications" for additional guidance.

Table B – Sample Selection of Temporary Modifications

Cornerstone	Inspection Objective	Risk Priority	Example
Mitigating Systems	Identify temporary modifications which could affect the design basis or the functional capability of plant mitigating systems Emphasize modifications which affect high safety significant Maintenance Rule SSCs/functions or modifications which affect SSCs/functions with high PRA rankings	Temporary modifications which could affect the design bases and functional capability of interfacing systems	Use of alternate material when specified replacement parts are not available During outages: Temporary electrical power to equipment required to minimize shutdown risk Alternate water sources for equipment cooling or fire protection of equipment required to minimize shutdown risk
Barrier Integrity	Identify temporary modifications which could affect the design basis or the functional capability of containment or reactor coolant system boundaries	Multiple temporary modifications to a single system or train, especially during outages Temporary modifications which require operator workarounds	Temporary changes to containment isolation motor operated valve designs. During outages: Temporary power improperly routed into containment when the ability to establish containment integrity is still required.

Modifications to one system may also affect the design bases and functioning of interfacing systems. In addition, similar modifications to several systems could introduce potential for common cause failures that affect plant risk. For temporary modifications, identification of temporary modifications on drawings and at placement of appropriate tags for equipment being affected by the temporary modification should make operators aware of their impact on the operation of plant equipment and components. The review of the installation (and, if applicable, the restoration from a temporary modification) ensures that the impact on the operation of other equipment is what is expected and previously analyzed, and to verify all other unexpected effects were subsequently evaluated with the results being there is no significant impact on the safe operation of plant or equipment.

The review of the post-installation test results is to ensure that the parent system remains operable and that its safety function has not been impaired. Licensees often use existing procedures, such as surveillance procedures, for post-modification testing. Although performance of existing procedures may have been reviewed by inspectors for other inspectable areas, inspectors should consider the appropriateness of using the existing procedures for validating the modification (as opposed to simply confirming continued operability).

03.02 Permanent modifications.

a. **Review the design adequacy of the modification.**

b. **Verify that modification preparation, staging, and implementation does not impair the following:**

   1. **In-plant emergency/abnormal operating procedure actions**

   2. **Key safety functions**

   3. **Operator response to loss of key safety functions**

c. **Verify that post-modification testing will maintain the plant in a safe configuration during testing.**

d. **Verify that post-modification testing establishes operability / functionality.**

e. **(Optional) Verify that design and licensing documents have either been updated or are in the process of being updated to reflect the modifications. Verify that significant plant procedures are updated to reflect the effects of the modification prior to being used.**

Specific Guidance

Preference should be given to reviewing modifications as they occur and that occur during at power operations or increased shutdown risk configurations. Selected permanent modifications may include permanent plant changes, design changes, set point changes, procedure changes, aging management changes, equivalency evaluations, suitability analyses, calculations, and commercial grade dedications. See Table C, “Sample Selection of Permanent Modifications” for additional guidance.

Table C – Sample Selection of Permanent Modifications

Cornerstone	Inspection Objective	Risk Priority	Examples
Initiating Events	Verify modifications have maintained system availability, reliability, and functional capability.	Modifications that increase the likelihood of initiating events	Modifications to reactor coolant pressure boundary Modifications to switchyard or feedwater controls
Mitigating Systems		Modifications which affect: • protection against external events such as fire, weather, and flooding • risk-significant design features and assumptions • functionality of mitigating systems used during risk-significant accident sequences	Modification of reactor building drain system Replacement of a low pressure safety injection system injection valve with a valve of a different design Modification to Class 1E DC power supplies
Barrier Integrity		Modifications which affect fuel cladding, reactor coolant system, or containment	Modification of personnel access hatch seal Modification to post accident containment heat removal systems

If an optional document and procedure updating review is conducted, examples of design documents which could be affected by modifications are: UFSAR, drawings, supporting calculations and analyses, plant equipment lists, vendor manuals, and PRA models. Examples of significant plant procedures which could be affected by modifications are normal, abnormal, alarm response, and emergency operating procedures, SAMGs, testing and surveillance procedures, and licensed operator training manuals.

For sites that have NRC authorization to use ASME Code Case N-752, "Risk-Informed Categorization and Treatment for Repair/Replacement Activities in Class 2 and 3 Systems, Section XI, Division 1," inspectors should consider if any implemented replacement activities are limited to applicable Low Safety Significant (LSS) ASME Class 2 or 3 pressure-retaining components or their associated supports.

Use of ASME Code Case N-752 is not applicable to:

- Piping within the break exclusion region [> Nominal Pipe Size (NPS) 4 / Nominal Diameter (DN) 100] for high energy piping systems.

- The portion of the Class 2 feedwater system [> NPS 4 / DN 100] of PWRs from the SG, including the SG, to the outer containment isolation valve.

- ASME Class 1, ASME Class Concrete Containment (CC), or ASME Class Metallic Containment (MC) components.

- Active functions of components (e.g., valve body may be in scope, but active internal sub-components would not be within scope).

Components replaced under ASME Code Case N-752 are still required to perform their intended safety-related functions under design-basis conditions. Inspectors should consider if replacement components and replacement activities meet original construction codes, or technical requirements of a nationally recognized standard / code. Inspectors should also consider if a licensee procedure used to implement replacement under ASME Code Case N-752 is maintained under 10 CFR 50, Appendix B. Inspectors can contact NRR/DRO/IRIB with any questions or issues relating to implementation of ASME Code Case N-752.

03.03 SAMG Update (If applicable)

Verify that site SAMGs are updated when the Boiling-Water Reactor Owners Group (BWROG) or Pressurized-Water Reactor Owners Group (PWROG) revise generic severe accident technical guidelines.

Specific Guidance

Note: Performance of this sample is intended to be completed upon issuance of a major revision to Owners Group guidelines (e.g., going from Revision 1 to 2). Inspectors can contact NRR/DRO/IRIB if there are questions regarding the significance of an interim revision.

Licensees have provided commitments that site SAMGs will be updated to future revisions of the BWROG or PWROG generic severe accident technical guidelines, and that the SAMGs will be integrated with other emergency response guideline sets and symptom-based Emergency Operating Procedures, and validated, using the guidance in accordance with processes outlined in NEI 14-01, “Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents.” NEI 14-01, Revision 1, was issued in February 2016 (ML16224A619). Section 3.2 of NEI 14-01 discusses that the main highlights of the site specific SAMG update process are document development, verification, and validation. Document development entails the licensee assessing the site specific applicability of each strategy presented in the generic severe accident technical guidelines. The licensee should assess the impact of any deviations from the generic severe accident technical guidelines. The licensee verification process should confirm that any referenced equipment, user-aides, supplies, etc. in the updated site specific SAMGs are actually available. The licensee validation process should demonstrate that the updated site specific SAMGs provides the instructions necessary to implement the guidance (i.e. can operators, technicians, etc. actually follow the document). Table top exercises are one way that the licensee may validate site specific SAMG updates.

Licensees have committed to such actions within 2 refueling outages or 3 years (whichever time period is greater) of the publication date of new BWROG or PWROG generic severe accident technical guidelines. The PWROG issued new severe accident

technical guidelines in February 2016 (Revision 0), while the BWROG issued a Revision 4 to severe accident technical guidelines guidance in June 2018. Verification of site specific adoption of these Owners Group revisions was completed via performance of this sample prior to the end of 2022. A list of the original licensee commitment letters can be found in an Enclosure to a NRC letter titled “Reactor Oversight Process Changes to Address Severe Accident Management Guidelines with Enclosure containing Commitment Letters by Site” (ML16032A029).

71111.18-04 REFERENCES

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

10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors”

IMC 0335, “Changes, Tests, and Experiments”

IMC 2515, “Light-Water Reactor Inspection Program - Operations Phase”

IP 71111.17T, “Evaluations of Changes, Tests, and Experiments”

IP 71152, “Problem Identification and Resolution”

NEI 14-01, Revision 1, “Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents,” Feb 2016 (ML16224A619).

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

NRC Regulatory Guide 1.187, “Guidance for Implementation of 10 CFR 50.59, Changes, Test, and Experiments,” Nov 2000 (ML003759710).

Reactor Oversight Process Changes to Address Severe Accident Management Guidelines with Enclosure containing Commitment Letters by Site (ML16032A029).

RIS 2016-03, “10 CFR 50.59 Issues Identified in NRC's San Onofre Steam Generator Tube Degradation Lessons Learned Report,” April 2016. (ML15196A575)

END

Attachment 1 – Revision History for IP 71111.18

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	ML073050453 01/31/08 CN 08-005	New procedure. Combined contents of IP 71111.17A and IP 71111.23 into IP 71111.18	No	N/A
N/A	ML082670330 10/31/08 CN 08-031	Revise to include consideration of GS –191 issue related to potential sump blockage. Editorial.	No	N/A
N/A	ML101320542 12/21/10 CN 10-028	Changed the minimum sample requirement from 3 temporary and 1 permanent modification reviews to 3 to 7 temporary and/or permanent modifications (feedback form 71111.18-1475).	No	N/A
N/A	ML15208A031 11/13/15 CN 15-024	Revisions are made in order to: (1) ensure that security-related issues identified as a result of changes are raised so that they may be considered under the Security Inspection Program; (2) ensure that there is awareness that changes to aging management programs associated with 10 CFR 54.21(d) are within scope of this IP; and (3) ensure that there is awareness that NEI 96-07, Revision 1, Appendix E, has not been reviewed or endorsed by the NRC. Feedback forms incorporated into this revision: 71111.17-2145. Feedback forms reviewed but not incorporated: 71111.18-1851, 2063, and 2110.	No	ML15208A095 71111.18-1851 ML15306A013 71111.18-2063 ML15306A015 71111.18-2110 ML15306A017 71111.17T-2145 ML15306A011

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	ML16138A284 ML16306A185 11/17/16 CN 16-031	Revisions are made to: (1) Provide oversight of licensee commitments to consider Severe Accident Management Guidelines (SAMGs) within plant configuration management processes in order to ensure that the SAMGs reflect changes to the facility over time. Additional background information can be found in SRM SECY-15-0065 (ML15239A767) and a February 23, 2016 letter from the NRC to NEI (ML16032A029). The February 23, 2016 letter, which also references the SRM, is added to the References section. (2) Address use of mandatory and discretionary language concerns and recommendations found in OIG-16-A-12 (ML16097A515).	No	ML16146A057 71111.18-2212 ML16188A244
N/A	ML18176A157 11/19/18 CN 18-039	Revisions are made to: (1) Provide oversight of licensee commitments to update site specific SAMGs when the PWROG/BWROG issues revised generic severe accident technical guidelines. Additional background information can be found in SRM SECY-15-0065 (ML15239A767) and a February 23, 2016 letter from the NRC to NEI (ML16032A029). (2) Conform to new IP format requirements found in IMC 0040 (ML18003A122).	None	ML18179A041

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	ML19070A127 04/01/19 CN 19-011	The following changes were made: 1) Sample Requirements revised to indicate SAMG update sample required in 2022. Inspectors have flexibility to sample earlier if desired. 2) Guidance on optional document review associated with section 03.02.e was in incorrect section, so it was relocated to appropriate guidance section (editorial change). 3) Specific guidance on SAMG updates is revised to discuss location of licensee SAMG commitment letters.	None	N/A. Document issued final without formal comment period. Regional Technical Support contacts informed of IP revision prior to issuance.
N/A	ML19197A103 11/26/19 CN 19-038	The following changes were made: 1) add guidance to consider plant modification changes to PRA for sites that have adopted provisions of 10 CFR 50.69, TS SFCP, or TS RICT. 2) Current Note in General Guidance states that potential issues regarding the impact that changes have on Emergency Preparedness and Security should be raised and addressed under their respective Inspection Programs. Note is revised to reiterate that Cyber Security issues fall under the Security Inspection Program.	None	ML19210C940
N/A	ML20238B974 10/05/20 CN 20-046	Revisions are made to add inspection samples specifically for Vogtle 3 & 4 as identified in SECY-20-0050, “Planned Revisions To The Baseline Inspection Program For The AP1000 Reactor Design,” (ML20058F491).	None	ML20239A739

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)
C1 SRM-SECY-16-0068	ML21040A185 3/31/21 CN 21-016	Revised to incorporate Commission direction in SRM-SECY-16-0068 to update the Reactor Oversight Process (ROP) to provide periodic oversight of the industry's Open Phase Condition initiative	None	ML21040A186
	ML22154A389 08/01/22 CN 22-015	Implemented recommended changes as a result of ROP Enhancement efforts. Removed requirement to perform SAMG sample in 2022 while maintaining the sample requirement as applicable for future SAMG updates.	None	ML22175A148
	ML24267A282 Date11/21/24 CN 24-036	Revised to: 1) add guidance on licensee use of ASME Code Case N-752, 2) clarify guidance on performance of SAMG update sample.	None	ML24267A291