ATTACHMENT 71111.18

INSPECTABLE AREA: Plant Modifications

CORNERSTONES: Initiating Events
Mitigating Systems
Barrier Integrity

INSPECTION BASES: Modifications to risk-significant structures, systems, and components (SSCs) can adversely affect their availability, reliability, or functional capability. Modifications to one system may also affect the design bases and functioning of interfacing systems. Similar modifications to several systems could introduce potential for common cause failures that affect plant risk. A temporary modification may result in a departure from the design basis and system success criteria. Modifications performed during increased risk configurations could place the plant in an unsafe condition. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance.

LEVEL OF EFFORT: Periodically screen active temporary and permanent modifications on systems which are ranked high in risk. Review the details of 3 to 5 temporary modifications and 1 to 2 permanent plant modifications performed on-line as they occur. Although the sample sizes are an annual goal, the inspection effort can be distributed on a quarterly basis.

71111.18-01 INSPECTION OBJECTIVE

This inspection will verify that modifications have not affected the safety functions of important safety systems. To verify that the design bases, licensing bases, and performance capability of risk significant SSCs have not been degraded through modifications. To verify that modifications performed during increased risk-significant configurations do not place the plant in an unsafe condition.

71111.18-02 INSPECTION REQUIREMENTS

02.01 Selection of Temporary and Permanent Modifications.

a. Select temporary modifications to risk-significant systems. For purposes of this inspection, temporary modifications 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.

b. Select permanent plant modifications for review which includes permanent plant changes, design changes, set point changes, procedure changes, equivalency evaluations, suitability analyses, calculations, and commercial grade dedications. At least one modification selected for review should have been identified during the conduct of Plant Status reviews. Also, select modifications planned to be performed when the plant is either on-line or during increased shutdown risk configuration.

02.02 Inspection

a. The list below is for inspection of temporary modifications.

1. Review the temporary modifications and associated 10 CFR 50.59screening 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. See section 02.02.b of this inspection procedure for additional attributes which may be considered for review. Inspect only those attributes which are significant for the particular modification being reviewed.

2. Verify that the installation and restoration of the temporary modifications (if accessible) are consistent with the modification documents. 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.

3. 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, review planned testing after removal of the temporary modifications.

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

5. Verify that licensee has evaluated the combined effects of the outstanding temporary modifications in regard to mitigating systems and the integrity of radiological barriers.

6. Review drawings, design and operating procedures, operations logs for temporary modifications that have not been evaluated or categorized.

b. The list below is for inspection of permanent modifications.

7. Design Review. During inspection preparation, identify which affected parameters listed in the following table are to be inspected. Emphasis should be placed on those parameters not verified by testing. Review the

design adequacy of the modification by performing the inspection activities for the selected parameters.

Affected Parameter	Inspection Activity
Energy Needs • electricity • steam • fuel + air • air	Verify energy requirements can be supplied by supporting systems when required under accident/event conditions. Verify energy requirements of modified SSCs will not deprive other SSCs of required energy under accident/event conditions.
Materials/Replacement Components • material compatibility • functional properties • environmental qualification • seismic qualification • classification	Verify materials/replacement components are compatible with physical interfaces. Verify material/replacement component properties serve functional requirements under accident/event conditions. Verify materials/replacement components are environmentally qualified for application. Verify replacement components are seismically qualified for application. Verify Code and safety classification of replacement SSCs is consistent with design bases. Verify replacement schedule consistent with inservice/equipment qualification life. Verify that new SSCs added to the plant have been reviewed for inclusion in the maintenance rule scope.
Timing • Sequence • Response Time • Duration	Verify that any sequence changes are bounded by accident analyses and loading on support systems are acceptable. Verify SSC response time is sufficient to serve accident/event functional requirements assumed by design analyses. Verify modified SSC response time does not cause an unintended interaction with other SSCs. Verify equipment will be able to function for the duration required under accident/event conditions.
Heat Removal	Verify that heat removal requirements can be addressed by support systems under accident/event conditions.

Affected Parameter	Inspection Activity
Control Signals • initiation • shutdown • control	Verify that control signals will be appropriate under accident/event conditions.
Equipment Protection • Fire • Flood • Missile • high energy line break • Freeze	Verify that equipment protection barriers and systems have not been compromised.
Operations	Verify that affected operation procedures and training have been identified and necessary changes are in process. Verify that the plant simulator has been updated as required.
Flowpaths	Verify that revised flowpaths serve functional requirements under accident/event conditions.
Pressure Boundary	Verify pressure boundary integrity is not compromised.
Ventilation Boundary	Verify that changes to ventilation boundaries do not increase risk of spreading contamination. Verify that changes to ventilation boundaries do not adversely affect functionality of ventilation system under accident/event conditions.
Structural	Verify modified SSCs structural integrity acceptable for accident/event conditions. Verify modified SSCs structural effects upon attachment points acceptable. Verify modified SSCs effect on seismic evaluations acceptable.
Process Medium • Fluid Pressures • Fluid Flowrates • Voltages • Currents	Verify that affected process medium properties will be acceptable for both modified SSCs and unmodified SSCs under accident/event conditions.
Licensing Basis • 10 CFR 50.59	Verify that necessary Technical Specification changes have been identified and NRC approvals, if required, were obtained prior to modification implementation. Verify acceptability of licensee's conclusions for those modifications where evaluations in accordance with 10 CFR 50.59 were not performed.

Affected Parameter	Inspection Activity
Failure Modes	Verify those failure modes introduced by the modification are bounded by existing analyses.

2. Implementation Review. Verify that modification preparation, staging, and implementation does not impair the following:

   (a) In-plant emergency/abnormal operating procedure actions

   (b) Key safety functions

   (c) Operator response to loss of key safety functions

3. Testing Review. Verify that post-modification testing will maintain the plant in a safe configuration during testing. Verify that post-modification testing will establish operability by:

   (a) Verifying that unintended system interactions will not occur.

   (b) Verifying SSC performance characteristics, which could have been affected by the modification, meet the design bases.

   (c) Validating the appropriateness of modification design assumptions.

   (d) Demonstrating that the modification test acceptance criteria have been met.

NOTE: 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 still need to verify the appropriateness of using the existing procedures for validating the modification (as opposed to simply confirming continued operability).

4. Updating Review (Optional)

   (a) Verify that design and licensing documents have either been updated or are in the process of being updated to reflect the modifications. Examples of design documents which could be affected by odifications are: updated final safety analysis report, drawings, supporting calculations and analyses, plant equipment lists, and vendor manuals.

   (b) Verify that significant plant procedures, such as normal, abnormal, and emergency operating procedures, testing and surveillance procedures, and licensed operator training manuals are updated to reflect the effects of the modification prior to being used.

(c) If the plant modification added or deleted functions that could affect the plant specific SDP worksheets, inform the Regional SRA.

02.03 Problem Identification and Resolution. Verify that problems associated with modifications are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee corrective action program. See Inspection Procedure 71152, "Identification and Resolution of Problems," for additional guidance. (Optional) In addition to the above, verify appropriateness of the corrective actions for selected sample of problems documented by the licensee involving plant modifications.

71111.18-03 INSPECTION GUIDANCE

03.01 General Guidance.

For inspection guidance of temporary modifications, see Table A below.

TABLE A

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

Cornerstone	Inspection Objective	Risk Priority	Example
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.

For inspection guidance of permanent modifications, see Table B below.

TABLE B

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
Barrier Integrity		Modifications which affect fuel cladding, reactor coolant system, or containment	Modification of personnel access hatch seal

03.02 Specific Guidance

The list below is inspection guidance of temporary modifications.

a. The review of the design aspects of a temporary modifications should focus on conformance to relevant design criteria not the programmatic elements of licensee programs.

b. The review of both the installation of and the restoration from a temporary modification is necessary to ensure 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.

c. 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.

d. Identification of temporary modifications on drawings and at placement of appropriate tags equipment being affected by the temporary modification should make operators aware of their impact on the operation of plant equipment and components.

e. The synergistic effects of outstanding temporary modifications is best judged based on whether there are new impediments to the safety functions of mitigating safety systems, degradation of radiological barriers, and an increase in the consequences of pertinent analyses in Chapter 15 of the FSAR.

f. Focus more attention on identifying temporary modifications not previously identified by the licensee if there is no existing program tasked with making interested parties aware of the existence of all temporary modifications.

The table below is inspection guidance of permanent modifications.

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Barrier Integrity		Modifications which affect fuel cladding, reactor coolant system, or containment	Modification of personnel access hatch seal

71111.18-04 RESOURCE ESTIMATE

The inspection procedure is estimated to take 36 to 48 hours a year at a site regardless of the number of units.

71111.18-05 COMPLETION STATUS

Inspection of the minimum sample size will constitute completion of this procedure in the Reactor Programs Systems (RPS). That minimum sample size will consist of the review of 3 temporary modifications; and 1 permanent modification.

71111.18-06 REFERENCES

Inspection Procedure 71111, Attachment 17, “Permanent Plant Modifications”

Inspection Procedure 71152, “Identification and Resolution of Problems”

END

ATTACHMENT: Revision History

ATTACHMENT

Revision History - IP 71111.18

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	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