
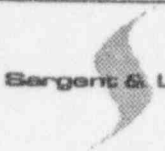


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Client: <u>Northeast Utilities</u>		
Station: <u>Millstone Unit 3</u>		
Title: REVIEW OF PLANT MODIFICATIONS PREPARED AFTER RECEIPT OF OPERATING LICENSE FOR TECHNICAL ADEQUACY AND FOR CONFIGURATION CONTROL		
<input checked="" type="checkbox"/> Safety-Related		<input type="checkbox"/> Non-Safety-Related
Reviewed By:		Approved By:
System Lead	Programmatic Lead	O&M Lead
Accident Mitigation Lead	QA Engineer	Internal Review Committee Chairman
Verification Team Manager		Date: <u>4-28-97</u>
<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> Description Rev. 1 </div> <div style="width: 80%;"> Revised PI to: <ul style="list-style-type: none"> Clarify that modification review process will verify design inputs. Add identification of partially installed modifications to SRG scope. Clarify SRG/ORG interface regarding procedure reviews. </div> </div>		
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1.0 PURPOSE

This instruction establishes the requirements for the review of modifications to systems included in the scope of the Independent Corrective Action Verification Program (ICAVP). The purpose of the modification review is to verify the adequacy of the engineering design and configuration control processes.

2.0 REFERENCES

- 2.1 NRC Inspection Manual Procedure 93801, Safety System Functional Inspection
- 2.2 10CFR50.2, Definitions
- 2.3 NRC Confirmatory Order Establishing Independent Correction Action Verification Program - Millstone Nuclear Power Station, Units 1,2, and 3
- 2.4 NUMARC 90-12, Design Basis Program Guidelines
- 2.5 PI-MP3-02, Review of System Design for Compliance with Design & Licensing Basis
- 2.6 PI-MP3-04, Programmatic Reviews
- 2.7 PI-MP3-05, Physical Plant Configuration Walkdowns
- 2.8 PI-MP3-06, Operations and Maintenance and Testing Procedures and Training Documentation Reviews
- 2.9 PI-MP3-09, Preparation and Approval of Checklists
- 2.10 PI-MP3-11, Discrepancy Report Submittal and Closure
- 2.11 PI-MP3-12, Project File Index

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2.12 CK-MP3-03, Series Checklists as follows:

CK-MP3-03-01 Modification Review Administrative Checklist
 CK-MP3-03-02 Modification Screening Checklist
 CK-MP3-03-03 Mechanical Systems Design Review
 CK-MP3-03-04 Electrical Design Review
 CK-MP3-03-05 I&C Design Review
 CK-MP3-03-06 Structural Design Review
 CK-MP3-03-07 ALARA Design Review
 CK-MP3-03-08 Security Review
 CK-MP3-03-09 Appendix R Compliance Review
 CK-MP3-03-10 Electrical Equipment Qualification Review
 CK-MP3-03-11 Seismic Qualification Review
 CK-MP3-03-12 Radiological Environmental Review
 CK-MP3-03-13 Non-Radiological Environmental Review
 CK-MP3-03-14 Station Blackout Review
 CK-MP3-03-15 Control Panel Design Review
 CK-MP3-03-16 Piping Design Review
 CK-MP3-03-17 Setpoint Database Design Review
 CK-MP3-03-18 Hazards/HELB Program Review
 CK-MP3-03-19 Fire Protection Review
 CK-MP3-03-20 Licensing Review
 CK-MP3-03-21 PRA Review
 CK-MP3-03-22 Quality Software Design Review
 CK-MP3-03-23 Installation Plan Review
 CK-MP3-03-24 Test Plan Review
 CK-MP3-03-25 Project Closeout Review

Note: Checklists used in the performance of this PI are not included as attachments to the PI. Checklists are prepared and controlled as separate documents per PI-MP3-09.

3.0 DEFINITIONS

- 3.1 **Operations & Maintenance and Testing Review Group (ORG)** - The subgroup of the ICAVP Verification Team responsible for the review of the operating, maintenance and testing procedures, and training materials for the systems within the scope of the ICAVP.
- 3.2 **System Review Group (SRG)** - The subgroup of the ICAVP Verification Team responsible for performing an in-depth review of the design of the systems in the scope of the ICAVP.

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- 3.3 **Configuration Review Group (CRG)** - The subgroup of the SRG responsible for walkdowns to verify the current as built conditions are in conformance with the design output documents.
- 3.4 **Design Bases** - The information which identifies the specific functions to be performed by a structure, system or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state of the art" practices for achieving functional goals or (2) requirements derived from analysis of the effects of a postulated accident for which a structure, system or component must meet its functional goals (Reference 2.2).
- 3.5 **Design Output Documents** - Controlled plant documents such as specifications, drawings, vendor drawings, datasheets, lists and databases (Reference 2.4).
- 3.6 **Design Process Documents** - Documents such as calculations, analysis, evaluations or other documented engineering activities that substantiate the final design (Reference 2.4).
- 3.7 **Current Licensing Basis (CLB)** - The set of NRC requirements applicable to a specific plant, and a licensee's written commitments for assuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and are in effect. The CLB includes the NRC regulations contained in 10 CFR Parts 2, 19, 20, 21, 30, 40, 50, 51, 55, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions, and Technical Specifications (TS). It also includes the plant-specific design basis information defined in 10 CFR 50.2 as documented in the most recent Final Safety Analysis Report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports. (Reference 2.7)
- 3.8 **Verifier** - The individual assigned to review engineering attributes within his area of responsibility.

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4.0 RESPONSIBILITIES

- 4.1 The Verification Team Manager shall be responsible for defining final report format and for overall management of the Verification Team.
- 4.2 The SRG Lead shall be responsible for assigning the Lead Verifier for each system in the ICAVP scope and for overall coordination of the SRG effort.
- 4.3 The Lead Verifier shall be responsible for reviewing modification elements within his area of expertise and for assigning verifiers with appropriate background for review of remaining elements.
- 4.4 The Verifiers shall be responsible for performing reviews of modification elements within their area of expertise in accordance with this instruction.

5.0 PROCEDURE

5.1 General

The Nuclear Regulatory Commission (NRC) Confirmatory Order referenced in Section 2.0 of this PI requires Northeast Utilities (NU) to implement the ICAVP. The confirmatory order also defines the scope of the ICAVP. Item 1 of the scope of the ICAVP described on page 13 of the confirmatory order requires the Licensee to perform a review of the engineering design and configuration control processes. The scope of the review encompasses the modifications to the selected systems since initial licensing.

This procedure provides the instructions for performing an orderly review of the modifications to the selected systems in order to comply with the confirmatory order and applies to both major modifications (DCR's) and minor modifications (MMOD's). DCN's generated to support the DCR/MMOD processes shall be included in the scope of the modification review. DCN's which support the like for like replacement process, the maintenance support engineering evaluation process and the NCR disposition process are not included in the scope of this review. Adequacy of the engineering design process will be determined by performing detailed technical reviews of the modification design elements including verification of design inputs and changes to design process documents and design output documents. Adequacy of the configuration control process will be determined by verifying that changes

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resulting from the modification have been reflected in design output documents, licensing documents such as the Technical Specifications and FSAR, plant procedures such as operating procedures, maintenance procedures and surveillance procedures, physical configuration and engineering programs. This project instruction only verifies the adequacy of the configuration control process as it relates to design output documents, engineering programs and licensing documents. Configuration control as it relates to plant physical configuration and plant procedures is covered by PI-MP3-05 and -06, respectively. Review of NU's design change process procedures is covered by PI-MP3-04.


The review of the system modifications shall be performed in chronological order because of the impact subsequent modifications can have on previous modifications. The SRG shall also be responsible for clearly identifying prior to the CRG and ORG review of the system modification, which portions of modification packages were subsequently revised by later modification. The SRG shall also clearly identify which modifications have not yet been installed or have been partially installed. These measures are needed to prevent generation of erroneous discrepancy reports during the CRG system walkdowns and the ORG review of plant procedures.

The systems included in the scope of this review and the applicable modification packages were identified and retrieved as part of the system review process described in PI-MP3-02. The specific tasks associated with the review of modifications include:


- a. Screening of affected modification elements.
- b. Review of affected modification design elements.
- c. Review of Installation and Test Plans.
- d. Review of Changes to Licensing Documents.
- e. Review of Modification Close-out.
- f. Discrepancy Report Preparation and Closure.
- g. Final Report Preparation.

The detailed instructions for performing these tasks are described in Subsection 5.2 through 5.8 below. Attachment 6.1 is a flow chart illustrating the modification review process.

5.2 Screening for Affected Modification Elements

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- 5.2.1 The SRG Lead shall screen the system modifications to identify whether the modification is a Mechanical, Electrical, I&C or Structural modification. The SRG Lead shall then assign a Lead Verifier from the applicable discipline to perform the modification review. The SRG Lead shall document this assignment on the Modification Review Administrative Checklist (Checklist CK-MP3-03-01).
- 5.2.2 The Lead Verifier shall screen the modifications for impact on modification elements by completing the Modification Screening Checklists (CK-MP3-03-02 Checklists). This task involves responding to a series of questions intended to minimize unnecessary discipline/program personnel review. The Lead Verifier may seek assistance as needed from other members within the SRG to respond to questions outside his area of expertise.
- 5.2.3 The Lead Verifier and Verifier(s) shall respond "yes" or "no" to each question on the checklists and shall initial each response. The topics addressed in the screening checklist include:
- MODIFICATION SCREENING SUMMARY
 - MECHANICAL SYSTEMS DESIGN REVIEW
 - ELECTRICAL DESIGN REVIEW
 - I&C DESIGN REVIEW
 - STRUCTURAL DESIGN REVIEW
 - ALARA DESIGN REVIEW
 - SECURITY REVIEW
 - APPENDIX R COMPLIANCE REVIEW
 - ELECTRICAL EQUIPMENT QUALIFICATION REVIEW
 - SEISMIC QUALIFICATION REVIEW
 - RADIOLOGICAL ENVIRONMENTAL REVIEW
 - NON-RADIOLOGICAL ENVIRONMENTAL REVIEW
 - STATION BLACKOUT REVIEW
 - CONTROL PANEL DESIGN REVIEW
 - PIPING DESIGN REVIEW
 - SETPOINT DATABASE DESIGN REVIEW
 - HAZARDS/HELB PROGRAM REVIEW
 - FIRE PROTECTION REVIEW
 - LICENSING REVIEW
 - PRA REVIEW
 - TRAINING PROCEDURES REVIEW
 - EMERGENCY PREPAREDNESS PROGRAM REVIEW

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- PLANT PROCEDURES REVIEW
(OPS, MAINTENANCE, SURVEILLANCE, TESTING)
- CONFIGURATION CHANGE REVIEW
- QUALITY SOFTWARE DESIGN REVIEW

- 5.2.4 When the screening process has been completed, the Lead Verifier shall indicate on the Modification Screening Checklist Summary Sheet (CK-MP3-03-02) which modification elements are affected.
- 5.2.5 The Lead Verifier shall then assign Verifiers from the applicable discipline to perform a detailed review of the affected modification elements in accordance with Subsection 5.3 of the project instruction. If the screening process identifies that physical plant configuration or plant procedures may be affected by the modification, the Lead Verifier shall forward the completed Modification Screening Checklist (CK-MP3-03-02) and a copy of the modification package to the CRG and ORG for their review. ORG concurrence is required on the section of the modification screening checklist regarding procedure impacts. This step shall not be performed until after all modifications to the system have been screened, the impact of subsequent modifications to previous modifications has been assessed, and the identification of modifications not yet installed or partially installed has been completed. Note: CRG and ORG modification reviews are covered by PI-MP3-05 and 06, respectively. Also, as part of their procedure review process, the ORG may request SRG to verify parameters in the plant procedures. This verification shall be documented by the SRG in the applicable ORG checklist (PI-MP3-06 checklist).
- 5.2.6 The Lead Verifier shall document on the Modification Review Administrative Checklist (CK-MP3-03-01) that the affected modification element screening process has been completed and shall file the Modification Screening Checklist in the project file per PI-MP3-12.
- 5.3 Review of Affected Modification Elements
- 5.3.1 The Verifier(s) assigned by the Lead Verifier shall perform a detailed review of the affected modification design elements within his area of responsibility. The detailed review shall include a verification of the technical adequacy of the design inputs and of changes to, or new, design process documents and design output documents prepared for the modification.

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- 5.3.2 The Verifier(s) shall review the modifications utilizing the applicable element review checklist. The element review checklists include:

<u>Checklist No.</u>	<u>Description</u>
CK-MP3-03-03	MECHANICAL SYSTEMS DESIGN REVIEW
CK-MP3-03-04	ELECTRICAL DESIGN REVIEW
CK-MP3-03-05	I&C DESIGN REVIEW
CK-MP3-03-06	STRUCTURAL DESIGN REVIEW
CK-MP3-03-07	ALARA DESIGN REVIEW
CK-MP3-03-08	SECURITY REVIEW
CK-MP3-03-09	APPENDIX R COMPLIANCE REVIEW
CK-MP3-03-10	ELECTRICAL EQUIPMENT QUALIFICATION REVIEW
CK-MP3-03-11	SEISMIC QUALIFICATION REVIEW
CK-MP3-03-12	RADIOLOGICAL ENVIRONMENTAL REVIEW
CK-MP3-03-13	NON-RADIOLOGICAL ENVIRONMENTAL REVIEW
CK-MP3-03-14	STATION BLACKOUT REVIEW
CK-MP3-03-15	CONTROL PANEL DESIGN REVIEW
CK-MP3-03-16	PIPING DESIGN REVIEW
CK-MP3-03-17	SETPOINT DATABASE DESIGN REVIEW
CK-MP3-03-18	HAZARDS/HELB PROGRAM REVIEW
CK-MP3-03-19	FIRE PROTECTION REVIEW
CK-MP3-03-21	PRA REVIEW
CK-MP3-03-22	QUALITY SOFTWARE DESIGN REVIEW


These checklists are intended to identify topics which should be reviewed for each element. The Verifier shall indicate on the checklist whether the topic has been addressed satisfactorily, was not addressed satisfactorily or is not applicable to the modification. comments needed to substantiate the Verifier(s) response shall be entered on the comment sheets included with each checklist.

- 5.3.3 The Verifier(s) shall perform a technical review of the new or revised design process documents in accordance with Section 5.4 of PI-MP3-02.
- 5.3.4 The Verifiers shall perform a technical review of new or revised design output documents including drawings, specifications and or lists. The review is a line by line review to verify the changes made to the design

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output documents are technically correct and consistent with the level of detail previously shown on the drawings.

- 5.3.5 When the review is completed, the Verifier shall sign and date the applicable element review checklist and forward the completed checklist to the Lead Verifier.
- 5.3.6 The Verifier shall generate a discrepancy report for any discrepancies identified during the review in accordance with Subsection 5.7 of this project instruction.
- 5.3.7 The Lead Verifier shall indicate on the Modification Review Administration Checklist (CK-MP3-03-01) that the affected modification element detailed review process has been completed. The Lead Verifier shall assemble and file the CK-MP3-03 series detailed element review checklists in the project file per PI-MP3-12.
- 5.4 Review of Installation & Test Plans
 - 5.4.1 The Lead Verifier shall review the modification scope and confer with other modification verifiers to determine installation and test(s) requirements. The Installation Plan Checklist (CK-MP3-03-23) and the Test Plan Checklist (CK-MP3-03-24) shall be used as the basis for identifying these requirements.
 - 5.4.2 Once installation and testing requirements have been identified, the Lead Verifier shall assign verifiers to review the installation plan and test plans contained in the modification package.
 - 5.4.3 The Verifier(s) shall review the installation plans utilizing Checklist CK-MP3-03-23. This review is intended to verify that appropriate installation requirements including welding procedures, ASME Section XI, NDE requirements, etc., are specified. Upon completion of their reviews, the Verifiers shall sign and date the checklists. Justification for responses entered on the checklists may be entered on the checklists comment sheet.
 - 5.4.4 The Verifier(s) shall review the test plans utilizing Checklist CK-MP3-03-24. The review is intended to verify that adequate test requirements including code required preservice tests and inspections, component level tests, system level tests and integrated tests are specified. Upon completion of the reviews, the Verifier(s)


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shall sign and date the checklists. Justification for responses entered on the checklists may be entered on the checklist summary sheet. If post modification tests are required, the SRG Lead Verifier shall submit the test requirements and acceptance criteria and Checklist CK-MP3-03-24 to the ORG for review.

- 5.4.5 Discrepancies identified during the installation and test plan review shall be processed in accordance with Subsection 5.7 of this project instruction. DRs regarding post-modification tests shall be reviewed with the ORG to determine whether the test that was performed was inadequate.
- 5.4.6 The Verifier(s) shall forward the completed checklists to the Lead Verifier.
- 5.4.7 The Lead Verifier shall indicate on the Modification Review Administrative Checklist (CK-MP3-03-01) that the installation and test plan review process has been completed and shall file the applicable checklists in the project file in accordance with PI-MP3-12.
- 5.5 Review of Changes to Licensing Documents
 - 5.5.1 The Lead Verifier shall perform a review of changes to licensing documentation including changes to the FSAR, Technical Specifications, and Environmental Plan, Security Plan, Emergency Plan to ensure accuracy and completeness. The Lead Verifier shall perform a review of the 10CFR50.59 safety evaluation or safety evaluation screening to verify completeness and accuracy.
 - 5.5.2 The Lead Verifier shall review the Licensing Document changes using Checklists CK-MP3-03-20. The intent of this review is to verify that changes due to modifications have been reviewed for impact on the FSAR, Technical Specifications, and Environmental Plan, Security Plan, and Emergency Plan. If it is determined that a change is required, the Lead Verifier shall verify changes were processed and shall review these changes for consistency with the modification. Upon completion of the review, the Lead Verifier shall complete Checklist CK-MP3-03-20, enter any comments on the checklist comment sheet and sign and date the completed checklist.

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- 5.5.3 The Lead Verifier shall review the safety evaluation prepared for the modification using Checklist CK-MP3-03-20. The intent of this review is to verify the modification is safe and satisfies the requirements of 10CFR50.59. Upon the completion of the review, the Lead Verifier shall complete Checklist CK-MP3-03-20, enter any comments on the checklist comment sheet and sign and date the completed checklist.
- 5.5.4 The Lead Verifier shall generate a Discrepancy Report in accordance with Subsection 5.7 of this PI for any discrepancy identified while performing Subsection 5.5.2 and 5.5.3.
- 5.5.5 The Lead Verifier shall indicate on the Modification Review Administrative Checklist (CK-MP3-03-01) that review of licensing document changes and the safety evaluation has been completed and shall file the applicable checklists in the project file per PI-MP3-12.
- 5.6 Review of Modification Close-out Activities
- 5.6.1 The Lead Verifier shall perform a review to verify adequate modification close-out. The intent of this review is to verify that changes identified in the modification package have been processed to incorporation or are identified as open changes. The scope of this review includes those design output documents, design process documents and licensing documents within the SRG scope. These documents as a minimum include:
- a. Calculations
 - b. Specifications
 - c. Drawings
 - d. Lists and Databases
 - e. Engineering Program Documents
 - f. FSAR
 - g. Technical Specifications
- 5.6.2 The Lead Verifier shall review modification close-out activities using Checklist CK-MP3-03-25.
- 5.6.3 The Lead Verifier shall complete Checklist CK-MP3-03-25, note any comments on the checklist comment form, and sign and date the checklist.

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5.6.4 The Lead Verifier shall generate a Discrepancy Report in accordance with Subsection 5.7 of this project instruction for any discrepancies identified during the review.

5.6.5 The Lead Verifier shall indicate on the Modification Review Administrative Checklist (CK-MP3-03-01) that the review of modification close-out activities has been completed and shall file the applicable checklists in the project file per PI-MP3-12.

5.7 Discrepancy Report Preparation and Closure

5.7.1 Discrepancy Reports for discrepancies identified during the system modification review process shall be prepared and processed in accordance with PI-MP3-11.

5.7.2 Review of NU dispositions for the Discrepancy Reports generated during the review cycle shall be in accordance with PI-MP3-11.

5.8 Final Report

5.8.1 The Lead Verifier shall draft a final report summarizing the results of the system modification review. The results of the review tasks described above shall be used to determine that adequacy of both design and configuration control processes for the development of modifications after receipt of the operating license.

5.8.2 The report format shall be determined by the Verification Team Manager.

5.8.3 The report shall be reviewed and approved by the VT Leads, VT Manager and IRC prior to external distribution.

6.0 ATTACHMENTS

6.1 ICAVP Process Flowchart, "Review of Modifications". (1 page)

ICAVP PROCESS FLOWCHART - REVIEW OF MODIFICATIONS

PI-MP3-03, REV. 1
ATTACHMENT 6.1

