

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Division of Quality Assurance, Vendor, and Technical Training Center Programs

Quality Assurance Branch

Report No: 50-423/85-29
Docket No.: 50-423
Licensee: Northeast Nuclear Energy Company
Facility Name: Millstone Unit No. 3
Inspection At: Stone and Webster Engineering Corporation, Boston, MA
Inspection Conducted: May 28-29, 1985
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MILLSTONE UNIT 3
Engineering Assurance In-Depth Technical Audit
Inspection of Program Preparation 50-423/85-29
May 28 and 29, 1985

1. Background

NRC inspection activities related to the Millstone 3 Engineering Assurance In-Depth Technical Audit are planned to be conducted in three phases:

1. Inspection of program preparation (Review plans and procedures)
2. Inspection of program implementation
3. Inspection of audit results and corrective actions.

2. Purpose

The purpose of this inspection was to accomplish the first phase of NRC inspection activities, namely inspection of the program preparation. Specifically, the NRC evaluated review plans for each technical discipline to ensure that the review plans were in accordance with the approved program plan and also that they were in sufficient technical depth to achieve the program objectives.

3. Personnel Contacted

A large number of NUSCo and SWEC personnel were contacted during the course of the NRC inspection. The following is a brief list of key personnel involved:

<u>Name</u>	<u>Organization</u>	<u>Position</u>
D. Malone	SWEC	Audit Team Leader
W. Eifert	SWEC	Chief Engineer, EA
R. Laudenat	NUSCo	Manager, Generation Facilities Licensing
D. Nordquist	NUSCo	Manager, Quality Assurance
E. Donegan	SWEC	Electrical Auditor
R. Fortier	SWEC	Mechanical Auditor
F. Chin	SWEC	Structural Auditor
T. Shaffer	NUSCo	Manager, I&C Engineering
D. Blumenthal	NUSCo	Engineer, QA

Enclosure

4. General Conclusions

General conclusions are provided in the forwarding letter for this inspection report.

5. Specific Comments

Specific comments of individual NRC discipline reviewers are provided in the attachment. Responses to individual observations will be reviewed by the NRC during its inspection of program implementation scheduled for June 24-28, 1985. These comments elaborate on the general comments stated in the cover letter and in some cases provide additional comments not considered to be of a general nature.

ATTACHMENT 1

MILLSTONE UNIT 3

SPECIFIC DISCIPLINE COMMENTS

MECHANICAL SYSTEMS DISCIPLINE

Observation No. 1.1 E&DCR and N&D Review Plans

The wording of some attributes of the E&DCR and N&D Review Plans may be open to interpretation by various auditors. Specifically, the Review Plans should focus on whether the reason for the change refers to the root-cause and whether the technical justification is documented by the project.

Observation No. 1.2 Calculations Review Plan

The calculations Review Plan does not specifically address:

1. Assumptions needing later verification, and
2. Assessing the appropriateness of computer codes used in calculation.

Observation No. 1.3 Calculations

Some non-safety-related equipment has been selected for review (e.g., dewatering pump). Other safety-related aspects of the system (e.g., sump screen sizing or system out-leakage) may be more appropriate for review.

Observation No. 1.4 Hazards Review Plan

The audit is not reviewing the design process for Seismic II/I hazards protection. The applicant is taking an approach to the Seismic II/I design that is similar to that used for the SEP plants. This approach relies heavily on walkdowns to determine adverse interactions and uses an acceptance criteria that is based solely on the experience gained from studying prior earthquake damage. This approach to Seismic II/I design has here-to-fore not been accepted by the NRC staff for NTOL plants, consequently, we have advised the NRR staff of this as a potentially open licensing issue. We understand that the final SWEC EAP report will not be able to reach conclusion regarding the Seismic II/I design process. This will be maintained as an open item in our review of the EAP pending resolution of the technical acceptability of your approach by NRR.

MECHANICAL COMPONENTS

Observation No. 2.1. Scope of Equipment Qualification Review Plan

The review of the equipment qualification area (Seismic) currently encompasses only the review of selected vendor reports for conformance with the design requirements as indicated in the design specification. This scope may be too narrow for the EA Technical Audit Team to draw meaningful conclusions.

Observation No. 2.2. Seismic Qualification Content of RP #1907-1

A checklist specifically for seismic and pressure boundary considerations was not developed.

Observation No. 2.3. RP #1901 - Consistency Between Design and FSAR Subjects Chosen

The inclusion of NRC Regulatory Guides 1.60 and 1.122 is not germane to the review of pipe stress and pipe support design. Regulatory Guides 1.60 and 1.122 pertain to the structural area.

Observation No. 2.4. Selection of NSSS Criteria Items

The items selected for review appeared too limited in that only nozzle load interface questions were to be addressed.

Observation No. 2.5. RP #1903-1 - Additional Requirements Regarding Calculation Review

A review of the pipe stress analysis checklist did not indicate that a number of technical areas which are normally essential to adequate design would be covered, namely: consideration of the flexibility of in-line components, confirmation that the assumed pipe support stiffness (in the piping analysis) is provided by the pipe support designed (as determined by calculation or other methodology), and consideration of equipment flexibility at anchors.

Observation No. 2.6. Small Bore Piping Calculation Review

A significant percentage of the plant piping is designed using the small bore piping design procedure entitled "Design and Installation of Small Bore Piping." Inasmuch as the maximum span length tables are an integral part of this document, it is important that the basis for these tables be reviewed, as well as other project-specific requirements.

Observation 2.7. Comprehensive Review of the Use of Computer Codes

The use of computer codes is extensive in both the pipe stress area (NUPIPE) and the pipe support area (STRUDL). However, questions concerning the correct application of the code and the determination of the effects of known errors found in the code are not addressed.

This problem concerns all disciplines using computer programs and is therefore generic.

Observation No. 2.8. Adequacy of E&DCR and N&D Preparation

The review of change (E&DCR) and nonconformance documents (N&D) is limited to the adequacy of the problem description and solution stated on the document. Such a review does not consider the completeness of the problem posed and whether all interdisciplinary considerations have been included.

This problem is generic since it encompasses the review of all change and nonconformance documents.

CIVIL/STRUCTURAL

Observation No. 3.1. Containment Liner Plate Analysis

The containment liner plate is subjected to pressure and thermal expansion/contraction load during the operation of the Recirculation Spray Systems (RSS). It is therefore important to verify that adequate design calculations have been performed to ensure the integrity of the liner plate.

Observation No. 3.2. Seismic Analysis of Containment Structure

Seismic data are used in the specification of all equipment, piping, and components, including those of the RSS. These seismic data are obtained from the seismic analysis of various buildings. Therefore, it is important to verify the adequacy of the seismic analysis.

Observation No. 3.3. Verification of Computer Programs

The computer programs used in the seismic analysis and in generating seismic spectra are not being verified. Adequate documentation should be available to demonstrate verification of these computer codes.

Observation No. 3.4. Design Verification of Refueling Water Storage Tank (RWST)

The design criteria and design calculations for the refueling water storage tank are not being reviewed to verify the tank's ability withstand tornado missile and seismic loads as specified in the FSAR. Further, the mathematical model of RWST to adequately account for sloshing of water inside the tank during a seismic event is not being reviewed.

Observation No. 3.5. FSAR Requirement

Analytical documentation that the gaps provided between adjacent structures are adequate to preclude impacting during a seismic event are not being reviewed.

Observation No. 3.6. Conduit/Cable Tray Supports

Cable tray design criteria documents NETM-46 and 47 or other documents are not being reviewed to verify consistency with the findings of the analytical and test work that is being performed by the owners group. Also, the data transmitted between electrical, EMD, and structural group is not being reviewed for consistency.

ELECTRIC POWER (EP) AND I&C

Observation No. 4.1. Items Not Included in Review Plans

The scope of the review plans did not always include all items or elements which are essential aspects of the design. The item is considered to be generic in that several review plans are missing the following elements:

<u>Review Plan</u>	<u>Discipline</u>	<u>Comment</u>
1901	EP	The following FSAR commitments were not listed for review: RG 1.118 RG 1.63 RG 1.97
	I&C	The following FSAR commitments were not listed for review: RG 1.118 RG 1.97
1902	EP	No areas of NSSS interface were chosen for review.
1903	EP	Calculations not selected for review included: Containment penetration assemblies, Circuit breaker coordination, Electrical input to Appendix R calculations.
1906	EP	The installation/work specifications were not being reviewed.
1907	Environmental Qualification	Westinghouse purchased equipment was not being evaluated for compliance with 10.CFR50.49.
1908	EP	Vendor documents for equipment such as MCCs, batteries, and battery chargers were not being reviewed.
1910	EP	Both advanced and regular E&DCRs were not being looked at.
1912	EP	Problem reports generated from IE Bulletins were not being evaluated.