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# TECHNICAL EVALUATION REPORT

## REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY EVALUATION REPORTS (F-11 and B-60)

NORTHEAST NUCLEAR ENERGY COMPANY
MILLSTONE POINT NUCLEAR POWER STATION UNIT 2

NRC DOCKET NO. 50-336

NRC TAC NO. 42493

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257

FRC ASSIGNMENT 13

FRC TASK 467

*Prepared by*

Franklin Research Center
20th and Race Streets
Philadelphia, PA 19103

FRC Group Leader: G. J. Toman

*Prepared for*

Nuclear Regulatory Commission
Washington, D.C. 20555

Lead NRC Engineer: P. Shemanski

February 21, 1983

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# FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Operating Reactors) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

## IDENTIFICATION OF PROPRIETARY INFORMATION

Some of the information in this technical evaluation report was obtained from manufacturers' proprietary test reports. All proprietary test reports are identified as such in Section 6, References, of this report. Checksheets in Section 4 containing proprietary information are stamped PROPRIETARY.

# 1. INTRODUCTION

## 1.1 PURPOSE OF THE EVALUATION

The purpose of this report is to:

- o evaluate licensees' resolutions of outstanding issues related to safety-related electrical equipment environmental qualification (EEQ) discussed in the Nuclear Regulatory Commission (NRC) Safety Evaluation Reports (SERs) in accordance with NRC criteria. The objective is to identify all cases where a licensee's response has not resolved the significant qualification issues.

- o evaluate licensees' qualification documentation of safety-related electrical equipment located in harsh environments in accordance with criteria established by the NRC and to identify (1) equipment for which qualification documentation is adequate, i.e., substantiates that the equipment is capable of performing its specified design basis safety function when it is exposed to a harsh environment and (2) equipment for which qualification documentation is deficient, i.e., does not give reasonable assurance that the equipment is capable of performing its specified safety function.

- o evaluate licensees' qualification documentation of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2) [4],* in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment.

## 1.2 SCOPE OF THE EVALUATION

The scope of this report is limited to the evaluation of environmental qualification of electrical equipment that must function to mitigate the consequences of a loss-of-coolant accident (LOCA) or high energy line break (HELB) and whose environment is adversely affected by that event.

*For References, see Section 6. Note that reference numbers are not presented in sequential order.

With respect to TMI Action Plan Implementation, the scope of this report is limited to those sections of NUREG-0737 [7] applicable to equipment having an installation implementation date of January 1, 1981. Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the Licensee.

The NRC has determined that the evaluation of environmental qualification of equipment items (1) located in plant areas whose environment is not adversely affected by the design basis event (DBE) (e.g., equipment located in "mild" environments) or (2) required to achieve and maintain cold shutdown, is not to be included within the scope of this report. However, where the Licensee has identified these equipment items in the EEQ submittals to the NRC, these items have been listed in NRC evaluation Category III.b in this report (see Section 3 of this report for definition of NRC evaluation categories).

Qualification aspects not included within the scope of this evaluation are:

- o seismic and dynamic qualification
- o equipment protection against natural phenomena
- o equipment operational service conditions (e.g., vibration, voltage, and frequency deviations)
- o equipment located where it is subjected to the outdoor environment
- o equipment protection against fire hazards
- o equipment protection against missiles
- o equipment located in plant areas whose environment is not adversely affected by the design basis event
- o equipment required to achieve and maintain cold shutdown.

## 1.3 GENERIC ISSUE BACKGROUND

Safety-related electrical equipment must be capable of performing design safety functions under all normal, abnormal, and accident conditions. The purpose of equipment qualification is to provide tangible evidence that equipment will operate on demand and to verify design performance, thereby establishing assurance that the potential for common-mode failure is minimized.

Of particular concern is the assurance that equipment will remain operable during and following exposure to the harsh environmental conditions (i.e., temperature, pressure, humidity [steam], chemical sprays, radiation, and submergence) imposed as a result of a design basis accident. These harsh environments are generally defined by the limiting conditions resulting from the complete spectrum of postulated break sizes, break locations, and single failures consequent to a LOCA, main steam line break (MSLB) inside the reactor containment, or a HELB outside the reactor containment (such as a main steam or feedwater line break). In addition, depending on specific plant design features, other postulated HELB locations may be associated with:

- o the chemical and volume control system (CVCS) letdown line
- o the steam supply piping to
  - the auxiliary feedwater (AFW) pump turbine
  - the reactor core isolation cooling (RCIC) pump turbine
  - the high pressure core injection (HPCI) pump turbine
  - the isolation condenser
- o steam generator blowdown.

The NRC criteria for reviewing the safety of nuclear power generating stations include the requirement that the qualification of safety-related electrical equipment be substantiated by auditable documentation of the program that establishes the ability of the equipment to function as specified in the station design. This report is restricted to a technical evaluation of the equipment's ability to function in harsh environments resulting from DBEs.

Qualification criteria applied during the licensing of the older nuclear power plants have been modified over the years, and specific industry standards concerning qualification have been revised as the design of reactor systems has changed and as regulatory and operating experience has accumulated. Examples of such standards are IEEE Standards 279-71, 323-74, 383-74, 317-76, 334-80, 381-77, 382-80, 535-79, 627-80, 649-80, and 650-79. NRC NUREG documents 0413 and 0588 have been developed to address this topic. In particular, NUREG-0588 (published for comment in December 1979 and reissued as Revision 1 in July 1981) formally presented the NRC staff positions regarding selected areas of environmental qualification of safety-related electrical equipment in the resolution of General Technical Activity A-24,

"Qualification of Class IE Safety Related Equipment." The positions documented therein are applicable to plants that are or will be in the construction permit or operating license review process.

Although qualification standards and regulatory requirements have undergone considerable development, all of the currently operating nuclear power plants are required to comply with 10CFR50, Appendix A, General Design Criteria for Nuclear Power Plants, Section I, Criterion 4. This criterion states in part that "structures, systems and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing and postulated accidents, including loss-of-coolant accidents."

Qualification requirements are also embodied in (1) 10CFR50 Appendix A, General Design Criteria 1, 2, and 23 and (2) 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Criteria III, "Design Control," and XI, "Test Control." These requirements are applicable to safety-related equipment located outside as well as inside containment.

The NRC staff has evaluated the licensees' equipment qualification programs by reviewing the qualification documentation of selected safety-related equipment as part of the operating license review for each plant. The NRC staff has also used a variety of methods to assure that these general requirements are met for electrical safety-related equipment. In the oldest plants, qualification was based on the fact that electrical components were of high industrial quality. After 1971, qualification was judged on the basis of IEEE Std 323-71; however, no regulatory guide was issued adopting this standard. For plants whose SERs were issued after July 1, 1974, the Commission issued Regulatory Guide 1.89, which in most respects adopted the most recent standard, IEEE Std 323-74.

In November 1977, the Union of Concerned Scientists petitioned the NRC Commissioners to upgrade current standards for the environmental qualification of safety-related electrical equipment in operating plants. Subsequently, the NRC staff instituted the Systematic Evaluation Program (SEP) to determine the degree to which the older operating nuclear power plants deviated from current

licensing criteria. The subject of electrical equipment environmental qualification (SEP Topic III-12) was selected for accelerated evaluation as part of this program. Seismic qualification of equipment was to be addressed as a separate SEP topic. In December 1977, the NRC issued a generic letter to all SEP plant licensees requesting that they initiate reviews to determine the adequacy of existing equipment qualification documentation.

Preliminary NRC review of licensee responses led to the preparation of NUREG-0458, an interim NRC assessment of the environmental qualification of electrical equipment. This document concluded that "no significant safety deficiencies requiring immediate remedial actions were identified." However, it was recommended that additional effort should be devoted to examining the installation and environmental qualification documentation of specific electrical equipment in all operating reactors.

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants," which required all licensees of operating plants (except those included in the SEP) to examine their installed safety-related electrical equipment and ensure appropriate qualification documentation for equipment function under postulated accident conditions. Subsequently, on February 8, 1979, the NRC Office of Inspection and Enforcement issued IE Bulletin 79-01, which was intended to raise the threshold of IE Circular 78-08 to the level of Bulletin, i.e., action requiring a licensee response. This Bulletin required a complete re-review of the environmental qualification of safety-related electrical equipment as described in IE Circular 78-08.

The review of the licensees' responses indicated certain deficiencies within the scope of equipment addressed, definition of harsh environments, and adequacy of support documentation. It became apparent that generic criteria were needed for evaluating the electrical equipment environmental qualification for both SEP and non-SEP operating plants. Therefore, during the second half of 1979, the Division of Operating Reactors (DOR) of the NRC issued internally a document entitled "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors" [2]. (The document is hereafter

referred to as the "DOR Guidelines.") The document was prepared as a screening standard for reviewing all operating plants, including SEP plants. It was originally intended that the licensees evaluate their qualification documentation in accordance with the DOR Guidelines. However, initial NRC review of this documentation, which was compiled to support licensee submittals, revealed the need for obtaining independent evaluations and for accelerating the qualification review program.

In October 1979, the NRC awarded Franklin Research Center a contract to provide assistance in the "Review and Evaluation of Licensing Actions for Operating Reactors," which included an assignment for review of equipment environmental qualification documentation under SEP Topic III-12. The assignment was to review equipment environmental qualification documentation and to present the results in the form of a Technical Evaluation Report for the 11 oldest plants (included in the SEP review). The plants included within the assignment were the Palisades, Oyster Creek, Ginna, Haddam Neck, Yankee Rowe, LaCrosse, and Big Rock Point plants and Zion Station Units 1 and 2, Indian Point Units 2 and 3, Millstone Unit 1, Dresden Unit 2, and San Onofre Unit 1. (This assignment was completed in April 1981.)

On January 14, 1980, the NRC Office of Inspection and Enforcement issued the DOR Guidelines and IE Bulletin 79-01B, which expanded the scope of IE Bulletin 79-01 and requested additional information on environmental qualification of safety-related electrical equipment at operating facilities, excluding the 11 facilities undergoing the SEP review. This Bulletin cited the DOR Guidelines as the criteria to be used in evaluating the adequacy of the safety-related electrical equipment qualification. The scope of the review was expanded to include HELBs (inside and outside containment) in addition to equipment aging and submergence. The NRC advised the licensees that the criteria contained in the DOR Guidelines would be used in its review of licensee submittals; NUREG-0588 would be used as a guide in cases where the DOR Guidelines do not provide sufficient detail.

In early February 1980, the NRC decided that Indian Point Units 2 and 3 and Zion Station Units 1 and 2 should be included within SEP Topic III-12 for the purpose of equipment environmental qualification review.

On February 21, 1980, the NRC and representatives of the SEP Plant Owners Group held an open meeting at NRC headquarters to discuss an accelerated review program in accordance with the DOR Guidelines. Representatives of the Indian Point Units and Zion Station also attended this meeting. The NRC formally issued to all licensees represented at the meeting the DOR Guidelines document which included a second document, "Guidelines for Identification of That Safety Equipment of SEP Operating Reactors for Which Environmental Qualification Is To Be Addressed" [2], together with the request that the licensees review their plant systems and provide additional equipment environmental qualification information to the NRC on an accelerated schedule.

For non-SEP plants, the NRC Office of Inspection and Enforcement formed a task force including a principal reviewer in each region and a task leader from headquarters. The regional members were assigned responsibility for the technical review of the licensees' responses to IE Bulletin 79-01B, and the task leader was assigned responsibility for the overall coordination of the review effort with NRC staff to assure overall consistency. The regional reviewers held meetings with the licensees in their respective regions, which resulted in staff positions being issued in a supplement to IE Bulletin 79-01B dated February 29, 1980.

In April 1980, the NRC organizational structure was modified and the Equipment Qualification Branch was formed within the new Division of Engineering. Responsibility for reviewing the status of equipment qualification for all plants was assigned to this branch.

On May 23, 1980, the NRC issued Memorandum and Order CLI-80-21 [5], specifying that licensees and applicants must meet the requirements set forth in the DOR Guidelines and NUREG-0588 regarding environmental qualification of safety-related electrical equipment in order to satisfy 10CFR50, Appendix A, General Design Criteria, Section I, Criterion 4. This Order also established that the SERs on this subject, to be prepared by the NRC staff, must be issued on February 1, 1981 and that all subsequent actions to be taken by licensees to achieve full compliance with the DOR Guidelines or NUREG-0588 must be completed no later than June 30, 1982. The Memorandum and Order established the DOR Guidelines and NUREG-0588 as acceptable interpretations of the General

Design Criteria for an interim period. Rulemaking was proposed for the purpose of establishing a permanent interpretation of the General Design Criteria.

The staff held regional meetings with the licensees and interested parties during the week of July 13, 1980. The staff issued a second supplement to IE Bulletin 79-01B, a response to significant questions raised during the public meetings, and two Orders. The Order dated May 30, 1980 required the licensees to comply with the previously issued Commission Memorandum and Order of May 27, 1980 (CLI-80-21). The above orders required the licensees to complete the tasks identified in IE Bulletin 79-01B no later than November 1, 1980 to allow the staff to comply with the February 1, 1981 date imposed by the Commission Order. The responses to the questions were issued on February 29, 1980; and the second and third supplements to IE Bulletin 79-01B, highlighting the staff positions affecting the licensees' responses, were issued on September 29 and October 24, 1980, respectively.

In October 1980, EG&G Idaho, Inc., awarded Franklin Research Center a contract to provide assistance in the equipment environmental qualification review for 13 of the plants whose licensees responded to IE Bulletin 79-01B. The assignment was to evaluate the licensees' equipment environmental qualification submittals and to present the results in the form of a Technical Evaluation Report for each plant. The objective of this Technical Evaluation Report was to review the licensees' submittals to determine if safety-related electrical equipment was reviewed for environmental qualification in accordance with the DOR Guidelines and NUREG-0588 as required by IE Bulletin 79-01B. The NRC was to perform an audit of the qualification documentation references as part of its Safety Evaluation Program. If discrepancies were found, the audit was to be extended. The plants included within this assignment were Nine Mile Point Unit 1, Millstone Unit 2, Salem Unit 1, Browns Ferry Units 1, 2, and 3, Brunswick Units 1 and 2, Hatch Units 1 and 2, Dresden Unit 3, and Quad Cities Units 1 and 2. (This assignment was completed in June 1981.)

In mid-1981, the NRC issued SERs on environmental qualification of safety-related electrical equipment to licensees of all operating plants.

Where additional qualification information was required, the licensees were directed to respond to the NRC within 90 days of receipt of the SER.

In May 1981, under the licensing action assistance contract, NRC authorized Franklin Research Center to proceed with the review and evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments, required for TMI Lessons Learned Implementation on 71 operating plants.

In July 1981, the NRC conducted extensive meetings with the nuclear industry to address concerns and questions regarding qualification of safety-related equipment. In addition, the NRC provided licensees with detailed information with respect to the format and expected content of the licensees' 90-day responses to the NRC SERs. Draft outlines of the following proposed programs were also presented to the industry: environmental qualification of equipment located in "mild" environments, seismic and dynamic qualification, and environmental qualification of mechanical equipment.

In October 1981, the NRC authorized Franklin Research Center to include within the scope of the existing EEQ assignment (TMI Lessons Learned Implementation Equipment) the evaluation of licensees' resolutions of outstanding issues related to equipment environmental qualification discussed in the NRC SERs in accordance with NRC criteria. The assignment was to review the qualification documentation and to present the results in the form of a Technical Evaluation Report for 71 operating plants. (This report was developed within the scope of this assignment.)

On January 7, 1982, the NRC Commissioners approved the issuance of the proposed rule, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," for public comment. The proposed rule was published in the Federal Register (Volume 47, No. 13) dated January 20, 1982.

In February 1982, Proposed Revision 1 to Regulatory Guide 1.89, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," was issued for public comment. This regulatory guide was issued to (1) reflect current NRC positions on equipment qualification and (2) provide guidelines for meeting the NRC Commissioners proposed rule on equipment qualification.

On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [46] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

On January 6, 1983, the Commissioners affirmed Part 50.49 of Title 10 of the Code of Federal Regulations, "Environmental Qualification of Electric Equipment for Nuclear Power Plants." The requirements of Part 50.49 do not apply to the documentation reviewed in this TER. However, the Licensee should be aware of the new rule since it may apply to new and corrective qualification efforts.

## 1.4 SPECIFIC ISSUE BACKGROUND

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants," which required all licensees of operating plants to examine their installed safety-related electrical equipment and ensure appropriate qualification documentation for equipment function under postulated accident conditions. Subsequently, on February 8, 1979, the NRC Office of Inspection and Enforcement issued IE Bulletin 79-01, which was intended to raise the threshold of IE Circular 78-08 to the level of Bulletin, i.e., action requiring a licensee response. This Bulletin required a complete re-review of the environmental qualification of safety-related electrical equipment as described in IE Circular 78-08.

On January 14, 1980, the NRC Office of Inspection and Enforcement issued the DOR Guidelines and IE Bulletin 79-01B, which expanded the scope of IE Bulletin 79-01 and requested additional information on environmental qualification of safety-related electrical equipment at operating facilities. This Bulletin cited the DOR Guidelines as the criteria to be used in evaluating the adequacy of the safety-related electrical equipment qualification.

The NRC staff held regional meetings with the licensees and interested parties during the week of July 13, 1980. The staff issued a second supplement to IE Bulletin 79-01B, a response to significant questions raised during the public meetings, and two Orders. The Order dated May 30, 1980 required the

licensees to comply with the previously issued Commission Memorandum and Order of May 27, 1980 (CLI-80-21). The above orders required the licensees to complete the tasks identified in IE Bulletin 79-01B no later than November 1, 1980 to allow the staff to comply with the February 1, 1981 date imposed by the Commission Order. The responses to the questions were issued on February 29, 1980; and the second and third supplements to IE Bulletin 79-01B, highlighting the staff positions affecting the licensees' responses, were issued on September 29 and October 24, 1980, respectively.

The NRC Office of Inspection and Enforcement (IE) performed (1) a preliminary evaluation of the Licensee's response, documented in a technical evaluation report (TER), and (2) an onsite verification inspection (September 23-26, 1980) of selected safety-related electrical equipment. The equipment associated with the chemical volume and control system and the auxiliary building ventilation system was inspected. The inspection verified proper installation of equipment, overall interface integrity, and manufacturers' nameplate data. The manufacturer's name and model number from the nameplate data were compared to information given in the Component Evaluation Work Sheets (CES) of the Licensee's report. The site inspection is documented in a report, IE 50-336/80-18, dated October 14, 1980. No deficiencies were noted.

On October 31, 1980 [1], Northeast Utilities provided the NRC with an equipment environmental qualification submittal in response to IE Bulletin 79-01B for Millstone Unit 2.

On January 30, 1981 [8], Northeast Utilities submitted to the NRC further equipment environmental qualification information in response to IE Bulletin 79-01B.

On April 30, 1981 [9], Northeast Utilities submitted to the NRC additional information to the previous response to IE Bulletin 79-01B.

The NRC issued a Safety Evaluation Report (SER) to Northeast Nuclear Energy Company on May 27, 1981 [10].

Requests for information [47, 48, 49, 59] were transmitted to the NRC by FRC to obtain qualification documentation referenced by the Licensee in its submittals, TMI Action Plan information, and correlations to NUREG-0737 [7].

By letter dated August 26, 1981 [11], Northeast Utilities transmitted to the NRC a response to the SER [10].

On February 9, 1982 [12], Northeast Utilities provided a response to the FRC request for additional information.

# 2. NRC CRITERIA FOR ENVIRONMENTAL QUALIFICATION

## 2.1 CRITERIA PROVIDED BY THE NRC

The screening guidelines used to evaluate the electrical equipment environmental qualification program were:

- DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 [2]
- NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [45].

Other appropriate references used in the review of the licensees' electrical equipment environmental qualification submittals are:

- IE Bulletin 79-01B, "Environmental Qualification of Class 1E Equipment," January 14, 1980; Supplement No. 1, February 29, 1980; Supplement No. 2, September 29, 1980; and Supplement No. 3, October 24, 1980 [43, 44, 3, 4]
- NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 [7]. This document is applicable for the selection of equipment for the evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The scope of the review is limited to equipment associated with specific sections of NUREG-0737 which have an installation implementation date of January 1, 1981. Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

## 2.2 STAFF POSITIONS AND SUPPLEMENTAL CRITERIA

The NRC identified the following staff positions and supplemental criteria to be used in conjunction with the referenced screening guidelines.

### 2.2.1 Requirements and Applicable Criteria

Items 3 and 17 of Supplement 2 to IE Bulletin 79-01B [3] describe the application of the DOR Guidelines and NUREG-0588 to operating reactors (ORs),

near term operating license applicants (NTOLs), and construction permit applicants (CPs). The qualification requirements and applicable criteria are stated as follows:

[Question 3]

"Define the requirements and applicable criteria for ORs, NTOLs, and OLs. Specifically address the NTOLs whose CP SER is prior to July 1974 and after July 1974. Can a CP whose SER is prior to 1974 use the DOR guidelines?"

[NRC Answer to Question 3]

"Table 1 describes the application of each document. All operating reactors as of May 23, 1980, will be evaluated against the DOR guidelines. In cases where the DOR guidelines do not provide sufficient detail, but NUREG-0588 Category II does, NUREG-0588 will be used.

TABLE 1

REQUIREMENTS

| ORs | OLs | | CPs |
|---|---|---|---|
| | CP SER | CP SER | |
| DOR GUIDELINES | Before 7/1/74 | After 7/1/74 | |
| USE NUREG-0588 AS NECESSARY | NUREG-0588 (CAT. II) | NUREG-0588 (CAT. I) | NUREG-0588 (CAT. I) or NEW RULE WHEN IN EFFECT |

REPLACEMENT COMPONENTS
USE NUREG-0588 (CAT. I)

All plants licensed after May 23, 1980, shall conform to NUREG-0588. In accordance with Regulatory Guide 1.89, all such operating licenses for facilities whose construction permit SER is dated July 1, 1974 or later, are to be reviewed against IEEE Std. 323-1974. Thus, for these licensees, the operating license applicant is to qualify equipment to the Category I column in NUREG-0588. For operating licenses issued after May 23, 1980, whose construction permit SER is dated before July 1, 1974, the operating license applicant is to qualify equipment to at least Category II column of NUREG-0588; unless the licensee made commitment in the construction permit record to use the 1974 standard, or unless the operating licensee application record indicates that the 1974 standard is to be used, in such cases Column I of NUREG-0588 is to be used.

While there are differences between the Category II column of NUREG-0588 and the DOR guidelines, the differences are in details and in the

optional part of the documents. The minimum requirements set forth by these documents are general and compatible. Thus, the minimum standards set by either of the two documents are equally applicable to ORs and NTOLs."

[Question 17]

"Define the requirements for 'replacement parts.' Are they the same for 'spare' parts? Clearly discuss the alternatives for existing inventories of parts/components. If equipment is ordered to meet IEEE Std. 323-1974 standard but lead time exceeds June 1982, can we use IEEE Std. 323-1971 qualified components in the interim?"

[NRC Answer to Question 17]

"The requirements for 'replacement' and 'spare' parts are the same for the purposes of complying with the Commission order and memorandum. After May 1980, all parts used to replace presently installed parts shall be qualified to Category I of NUREG-0588 'unless there are sound reasons to the contrary.' Nonavailability and/or the fact that the part to be used as a replacement is a spare part purchased prior to May 23, 1980, and is in stock are among the factors to be considered in weighing whether there are 'sound reasons to the contrary.' All replacement parts shall as a minimum conform to the requirements described in the answer to question 3. Justification for deviation from Category I of NUREG-0588 shall be documented by the licensee and records shall be available for audit, upon request by the NRC."

### 2.2.2 Application of Requirements and Criteria to TMI Lessons Learned Implementation Equipment

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment. Additionally, Item 21 of Supplement 2 to IE Bulletin 79-01B [3] states:

"TMI Lessons Learned instrumentation will be considered in the February 1, 1981 SER. This equipment is subject to the same requirements as other safety-related electrical equipment. The guidance and requirements of NUREG-0588 referenced daughter standards, and Reg Guides will be used by the staff in assessing the adequacy of the qualification information."

Item 2 of Supplement 3 to IE Bulletin 79-01B [4] states:

"IEB 79-01B required a 90 day response which was due in mid-April 1980. Supplement 1 (Feb. 1980) informed licensees that equipment which was

'planned' to be installed as a result of lessons learned need not be addressed in that response. Some of this equipment has since been installed. Supplement #2 (Q.5, Q.21) identified that the staff position was that equipment which is installed should be treated in a manner similar to all other safety-related electrical equipment and be addressed in the November 1, 1980 submittal. This position represents no change in staff position regarding the scope of the review. However, since the staff position on this issue was unclear the following will apply:

a. Qualification information for installed TMI Action Plan equipment must be submitted by February 1, 1981.

b. Qualification information for future TMI Action Plan equipment (ref. NUREG-0737, when issued), which requires NRC pre-implementation review, must be submitted with the pre-implementation review data.

c. Qualification information for TMI Action Plan equipment currently under NRC review should be submitted as soon as possible.

d. Qualification information for TMI Action Plan equipment not yet installed which does not require pre-implementation review should be submitted to NRC for review by the implementation date."

### 2.2.3 Equipment Not in the Scope of the Qualification Review

Supplement 2 of IE Bulletin 79-01B [3] permits deferment of the review of environmental qualification for all safety-related equipment items located in plant areas where the equipment is not exposed to the direct effects of a high energy line break (HELB) or to nuclear radiation emanating from circulation of fluids containing radioactive substances. Supplement 3 of IE Bulletin 79-01B [4] permits deferment of the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition. Supplements 2 and 3 of 79-01B originally permitted deferment until after February 1, 1981 of the qualification review of equipment located in a mild environment or required to achieve and maintain the plant in a cold shutdown condition. Since the issuance of Supplements 2 and 3, the NRC has determined that the review of environmental qualification for this equipment is not within the scope of the present review program.

## 2.2.4 Clarification of Qualification Requirements

### 2.2.4.1 Service Conditions Inside Containment for a Loss-of-Coolant Accident (DOR Guidelines Section 4.1)

For pressurized water reactors (PWRs), the DOR Guidelines state that the containment temperature and pressure conditions as a function of time should be based on the most recent NRC-approved service conditions specified in the Final Safety Analysis Report (FSAR) or other licensee documentation. In the specific case of pressure-suppression type containments, the following minimum high temperature conditions may be used: (1) boiling water reactor (BWR) drywells -- 340°F for 6 hours and (2) PWR ice condenser lower compartments -- 340°F for 3 hours. As stated in Supplement 2 to IE Bulletin 79-01B [3], "these values are a screening device, per the Guidelines, and can be used in lieu of a plant-specific profile, provided that expected pressure and humidity conditions as a function of time are accounted for."

Service conditions should bound those expected for coolant and steam line breaks inside containment with due consideration given to analytical uncertainties. The steam line break condition should include superheated conditions, the peak temperature, and subsequent temperature/pressure profiles as functions of time. If containment spray is to be used, the impact of the spray on required equipment should be assessed.

The adequacy of a plant-specific profile depends on the assumptions and design considerations at the time the profiles were developed. The DOR Guidelines and NUREG-0588 provide guidance and considerations required to determine if the calculated plant-specific temperature/pressure profiles encompass the loss-of-coolant accident (LOCA) and HELB accidents inside containment.

### 2.2.4.2 Submergence (DOR Guidelines Section 4.1, Subitem 3; and Section 4.3.2, Subitem 3)

Equipment submergence (inside or outside containment) should be addressed where the possibility exists that submergence of equipment may result from HELBs or other postulated occurrences. Supplement 2 to IE Bulletin 79-01B [3] provides the following additional criterion: If the equipment satisfies the

guidance and other requirements of the DOR Guidelines or NUREG-0588 for the LOCA and HELB accidents, and the licensee demonstrates that its failure will not adversely affect any safety-related function or mislead the operator after submergence, the equipment can be considered exempt from the submergence portion of the qualification requirements.

2.2.4.3 Simulated Service Conditions and Test Duration
(DOR Guidelines Section 5.2.1)

The Guidelines require that the test chamber environment envelop the required service conditions for a time equal to the period from the initiation of the accident until the service conditions return to normal. Supplement 2 to IE Bulletin 79-01B [3] provides the following additional criterion:

> "Equipment designed to perform its safety-related function within a short time into an event must be qualified for a period of at least 1 hour in excess of the time assumed in the accident analysis. The staff has indicated that time is the most significant factor in terms of the margins required to provide an acceptable confidence level that a safety-related function will be completed. The 1-hour qualification requirement is based on the acceptance of a type test for a single unit and the spectrum of accidents (small and large breaks) bounded by the single test."

2.2.4.4 Test Sequence
(DOR Guidelines Section 5.2.3)

Supplement 2 to IE Bulletin 79-01B [3] provides the following additional criteria:

> "Sequential testing requirements are specified in NUREG-0588 and the DOR Guidelines. Licensees must follow the test requirements of the applicable document.
>
> 1. If the test has been completed without aging in sequence, justification for such a deviation must be submitted.
>
> 2. If testing of a given component has been scheduled but not initiated, the test sequence/program should be modified to include aging.
>
> 3. Test programs in progress should be evaluated regarding the ability to comply by incorporating aging in the proper sequence. These programs would then fall in the first or second category."

2.2.4.5 Radiation
(DOR Guidelines Sections 4.1.2, 4.2.2, and 4.3.2, Subitem 2)

Supplement 2 to IE Bulletin 79-01B [3] provides the following additional criteria:

"Both the DOR Guidelines and NUREG-0588 are similar in that they provide the methods for determining the radiation source term when considering LOCA events inside containment (100% noble gases/50% iodine/1% particulates). These methods consider the radiation source term resulting from an event which completely depressurizes the primary system and releases the source term inventory to the containment.

NUREG-0578 provides the radiation source term to be used for determining the qualification doses for equipment in close proximity to recirculating fluid systems inside and outside of containment as a result of LOCA. This method considers a LOCA event in which the primary system may not depressurize and the source term inventory remains in the coolant.

NUREG-0588 also provides the radiation source term to be used for qualifying equipment following non-LOCA events both inside and outside containment (10% noble gases/10% iodine/0% particulates).

When developing radiation source terms for equipment qualification, the licensee must ensure consideration is given to those events which provide the most bounding conditions. The following table summarizes these considerations:

| | LOCA | Non-LOCA HELB |
|---|---|---|
| Outside Containment | NUREG-0578 (100/50/1 in RCS) [*] | NUREG-0588 (10/10/0 in RCS) |
| Inside Containment | Larger of | |
| | NUREG-0588 (100/50/1 in containment) | NUREG-0588 (10/10/0 in RCS) |
| | or | |
| | NUREG-0578 (100/50/1 in RCS) | |

*The numbers in parentheses represent % noble gases/% iodine/% particulates. RCS means reactor coolant system.

Gamma equivalents may be used when consideration of the contibutions of beta exposure has been included in accordance with the guidance given in the DOR Guidelines and NUREG-0588. Cobalt 60 is one acceptable gamma radiation source for environmental qualification of safety-related equipment. Cesium 137 may also be used."

### 2.2.5 Additional Clarification of Qualification Requirements

The NRC has worked with a number of licensees, at their requests, to provide further clarification on environmental qualification requirements. On January 20, 1982, the NRC issued Generic Letter No. 82-09 [46] presenting staff positions on certain aspects of the qualification requirements. Generic Letter No. 82-09 states:

"1. Operator Display Instrumentation

Q. Given the interrelated activities associated with display instrumentation (e.g., NUREG-0700, NUREG-0799, proposed Regulatory Guide 1.97 and Equipment Qualification efforts), what display instrumentation referenced in emergency operating procedures must be identified in licensee submittal to the NRC?

A. All display instrumentation referenced in the emergency procedures need not be identified. The NRC requires that licensees need only identify and have available qualification documentation on those operator display instruments which are safety-related (see Question 2). If licensees have previously supplied a listing of all display instrumentation referenced in emergency procedures, licensees may identify (such as by the use of an *) which of those instruments are safety-related. The staff will defer review of the basis for this safety-related classification until other NRC activities[1] have been implemented. When these other activities are implemented, additional instruments presently not requiring qualification may require upgrading to a safety-related status and/or may require qualification. Licensees will be required at that time to qualify this instrumentation in accordance with the following criteria:

- For new or upgraded instrumentation with a required operation date prior to the equipment qualification deadline, qualification must be accomplished by the equipment qualification deadline.

[1]Such activities include preparation of new emergency procedures (NUREG-0799), control room design reviews (NUREG-0700), and upgrading of accident monitoring instrumentation (Reg. Guide 1.97 and NUREG-0737).

- For new or upgraded instrumentation with a required operation date after the equipment qualification deadline, qualification must be accomplished prior to equipment operation and plant acceptance.

2. Safety-Related Equipment

Q. For Equipment Qualification purposes, what constitutes all safety-related electrical equipment?

A. The Commission, in CLI-80-21, required the environmental qualification of only safety-related electrical equipment. Identification of the safety-related equipment installed at specific plants can be obtained from FSARs, Technical Specifications and other docketed correspondence setting forth NRC requirements or licensee commitments. Identification of safety-related equipment installed in harsh environments at specific plants must be supplied by the licensee. The necessity for upgrading nonsafety-related system to safety-related status will be the subject of other NRC reviews.

3. Replacement Parts

Q. Please clarify the NRC requirements on replacement parts.

A. In CLI-80-21, the Commission stated that unless there were sound reasons to the contrary, replacement equipment should be qualified to the standards set forth in Category I of NUREG-0588. The Commission's position was designed to promote the policy of upgrading the environmental qualification and reliability of installed safety-related electrical equipment. To meet this overall goal, licensees must institute internal policy practices consistent with the Commission's statement.

Situations may arise in which upgrading to NUREG-0588, Category I of replacement equipment qualified to NUREG-0588, Category II or the DOR Guidelines will not be compatible with overall station safety and performance goals. Licensees must review such situations on a case-by-case basis and determine that 'sound reasons to the contrary' do, in fact, exist which warrant the use of replacement equipment (not necessarily in-kind) qualified to the DOR Guidelines or NUREG-0588, Category II. For equipment located in a harsh environment, licensees' procedures must provide for documentation and substantiation of such determinations.

Conditions which reflect sound reasons why qualification standards for replacement of equipment in a harsh environment need not be upgraded to NUREG-0588, Category I include the following:

1. The licensee has replacement equipment in stock that meets the DOR Guidelines or NUREG-0588, Category II, and procurement actions regarding such replacement equipment had commenced prior to May 23, 1980.

2. Replacement equipment qualified to the NUREG-0588, Category I standards does not exist.

3. Replacement equipment qualified to the NUREG-0588, Category I standards is not available to meet installation and operation schedules. Equipment qualified to the DOR Guidelines or NUREG-0588, Category II may be used for an interim period until Category I equipment is obtained and an outage of sufficient duration is available for replacement. Justification for use of the non-Category I qualified replacement equipment beyond this interim period must be submitted to the NRC for approval prior to the end of the interim period and in sufficient time for reasonable NRC review.

4. Replacement equipment qualified to NUREG-0588, Category I standards would require significant plant modifications to accommodate its use.

5. Operating performance and reliability data for the Category I equipment indicates poor overall equipment performance. For example, mean time to failure is significantly shorter for the Category I replacement equipment.

6. The use of replacement equipment qualified to NUREG-0588, Category I standards has a significant probability of creating human factor problems that will negatively affect plant safety and performance, e.g., (1) knowledge, skills and ability of existing plant staff require significant upgrading to operate or maintain the specific Category I replacement equipment; (2) the use of equipment qualified to Category I standards creates a one-of-a-kind application; or (3) maintenance, surveillance or calibration activities are unnecessarily complex.

5. Submergence Outside Containment

Q. For equipment qualification purposes, what are the staff requirements concerning submergence of equipment outside containment?

A. The Staff requires that the licensee submit documentation on the qualification of safety-related equipment that could be submerged due to a high energy line break outside containment.

6. Radiation

Q. Is the staff screening value of $4 \times 10^7$ rads applicable to all operating reactors?

A. No. This screening value is applicable only to PWRs with dry type containments. However, for PWRs with dry type containments, the licensee may choose to use plant specific analysis instead of the screening value. For plants with other containment types, the licensee must use plant specific analysis.

Acceptable to the Staff for equipment qualification purposes are radiation values developed as part of the plant licensing process provided that they are based on the TID14844 source terms and are conservatively performed. In order to assure that the methodologies are appropriate, the Staff requests two component specific sample calculations (one for inside and one for outside containment), and a brief written description of each of the methodologies used, their application and associated conservatisms. Such sample calculations and a statement by the licensee that the values of radiation exposure of components so derived are appropriate for environmental qualification of equipment will satisfy the Staff's concern on the 'Radiation Specification Value' used during the qualification reviews.

7. Containment Service Conditions

Q. Must the Staff value (identified in the SERs) of $T_{SAT}$ for PWRs and $T_{SAT}$ + 20°F for BWRs be used as the maximum in-containment temperature for the purpose of equipment qualification?

A. No. The Staff will accept the use of these values. However, an acceptable alternative to the NRC staff's temperature criterion used for the service conditions must base that service condition on the FSAR analysis or other NRC approved analysis, provided that the specific analysis, or a summary of that analysis, together with reference to the previous NRC acceptance of the analysis is submitted by the licensee. In addition, some of the information in the associated safety evaluation may require clarification.

8. One Hour Minimum Operating Time

Q. The Staff has previously indicated that certain exceptions to the one hour minimum operating time rule are permitted. Can further clarification be provided?

A. With regard to plants subject to the qualification requirements of the DOR Guidelines or Category II of NUREG-0588, for those pieces of equipment tested prior to May 23, 1980, the test data and analysis may be used to qualify the equipment to the required operating time plus an appropriate margin. The one hour margin requirement need not be applied. However, subsequent failures should be shown not to be detrimental to plant safety.

The one hour time margin rule is not applicable to equipment whose safety function is performed prior to significant changes in the environment at the equipment location.

9. Aging

Q. Must a qualified life be developed for all safety-related electrical equipment located in harsh environments?

A. Section 7 of the DOR Guidelines and Section 4.2, Category II of NUREG-0588, do not require a qualified life to be established for all safety-related electrical equipment located in harsh environments. A qualified life, in accordance with the provisions in IEEE 323-1974, is required for equipment, including replacement parts, qualified to Category I of NUREG-0588 that is located in a harsh environment.

An acceptable method for addressing in-service degradation is through a preventive maintenance/surveillance program with equipment and component refurbishment and/or replacement based on known susceptibility to aging degradation, the results of inspections, or manufacturers recommendations. These elements of the program lead to an understanding on a device specific basis of the nature and extent of the increased stress levels encountered during Design Basis Accidents and resultant degradation (if any) which may occur. Arrhenius or other appropriate accelerated aging methodologies may be used to establish replacement and refurbishment schedules if the component's design and materials application are sufficiently simple and the necessary data are available to allow a meaningful application.

In plants subject to the qualification requirements of either the DOR Guidelines or NUREG-0588 Category II, for equipment that has been identified as being susceptible to significant degradation due to thermal and radiation aging, the schedule for inspection of and/or replacement of the susceptible components in that equipment must be incorporated into the preventive maintenance and surveillance programs, and that information should be incorporated into the system component evaluation worksheets (SCEWS). For other equipment, the aging column in the SCEWS should be marked 'No Known Susceptibility'."

# 3. METHODOLOGY USED FOR THE EVALUATION

## 3.1 INTRODUCTION

As discussed in Section 1.3 of this report, the NRC issued Safety Evaluation Reports (SERs) on environmental qualification of safety-related equipment to licensees of all operating plants in mid-1981.

The SERs identified various equipment qualification deficiencies as indicated below:

LEGEND: DESIGNATION FOR DEFICIENCY

| | | | |
|---|---|---|---|
| R | - Radiation | M | - Margin |
| T | - Temperature | I | - HELB Evaluation Outside Containment Not Completed |
| QT | - Qualification Time | QM | - Qualification Method |
| RT | - Required Time | RPN | - Equipment Relocation or Replacement, Adequate Schedule Not Provided |
| P | - Pressure | EXN | - Exempted Equipment Justification Inadequate |
| H | - Humidity | SEN | - Separate Effects Qualification Justification Inadequate |
| CS | - Chemical Spray | QI | - Qualification Information Being Developed |
| A | - Material Aging Evaluation, Replacement Schedule, Ongoing Equipment Surveillance | RPS | - Equipment Relocation or Replacement Schedule Provided |
| S | - Submergence | | |
| (R) | - Licensee has committed to replace equipment | | |

The SERs directed licensees to "either provide documentation of the missing qualification information which demonstrates that safety-related equipment meets the DOR Guidelines or NUREG-0588 requirements or commit to a corrective action (re-qualification, replacement [etc.]) to establish qualification by June 30, 1982." Licensees were required to respond to the NRC within 90 days of receipt of the SER.

As stated in Section 1.1, the purpose of this report is (1) to evaluate licensees' resolutions of outstanding issues related to safety-related electrical equipment environmental qualification (EEQ) discussed in the NRC's SERs in accordance with NRC criteria, and (2) to evaluate licensees' qualification documentation of safety-related electrical equipment, including

TMI Lessons Learned Implementation equipment, located in harsh environments in accordance with criteria established by the NRC (see Section 2 of this report). The methodology used to evaluate (1) the Licensee's response to the NRC SER and (2) the equipment environmental qualification is presented herein.

## 3.2 METHODOLOGY

The Licensee, Northeast Utilities, provided a response to the SER and additional qualification information in its submittals [11, 12] to the NRC for Millstone Point Nuclear Power Station Unit 2.

The following bases provided by the NRC were used to determine the relative completeness of the Licensee's submittals:

- Determine whether the Licensee provided specific responses to the SER concerns.
- Determine whether the Licensee proposed corrective actions and a schedule for completion of the actions.
- Determine whether the Licensee addressed the NRC's concern for margin with respect to the containment environmental conditions.
- Determine whether the Licensee revised the environmental parameters.
- Determine whether the Licensee's System Component Evaluation Work Sheets (SCEWS) were updated to correct deficiencies and add supplemental information.
- Determine whether the Licensee provided justifications for interim operation for all unqualified equipment.
- Determine whether the Licensee addressed aging and incorporated the results into the equipment maintenance program.

The extensive list of safety-related electrical equipment* in various locations of the plant identified by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an

*In this report, the term "safety-related electrical equipment" refers to the equipment defined by the two NRC Guidelines referenced in Section 2.1.

"equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions (e.g., Flow Transmitter, Fischer & Porter, Model 10B2496, located within containment). This analysis resulted in a reduced listing of equipment (equipment items) that formed the basis for the review.

Appendix A contains the environmental service conditions for each location. Appendix B contains the tabulation of the equipment items, locations, function, plant identification numbers, required operating time, and applicable qualification documentation references. Appendix C lists the plant systems identified by the Licensee and the NRC as being essential to safety.

Each item in the list of safety-related electrical equipment items was reviewed in relation to:

- the Licensee's response to the SER concerns
- technical information received from the Licensee as a result of requests for additional information (Appendix E)
- technical data derived from the Licensee's submittal
- NRC DOR Guidelines or NUREG-0588 Revision 1 criteria
- the Licensee's definition of harsh service environments (Appendix A)
- documentation cited by the Licensee as evidence of qualification
- applicable and available qualification documentation associated with the overall equipment environmental qualification program
- the Licensee's analysis and/or justification of qualification
- Licensee-proposed corrective action for qualification deficiencies
- the Licensee's equipment/part replacement schedules
- the Licensee's technical arguments concerning the adequacy of equipment, based on system operational considerations
- the Licensee's rationale concerning exemption of equipment from qualification.

Topics not within the scope of the evaluation are:

- o completeness of the Licensee's listing of safety-related equipment
- o acceptability of Licensee-provided environmental service conditions.

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2), in accordance with criteria established by the NRC (see Section 2 of this report) in a manner identical to the evaluation of all other safety-related electrical equipment. The scope of this review is limited to TMI Action Plan equipment associated with those sections of NUREG-0737 which have an equipment installation implementation date of January 1, 1982 (sections are identified below). Where applicable, a review was to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment

II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

II.E.1.2 (PWR/1-1-81) Auxiliary Feedwater System Automatic Initiation and Flow Indication

II.E.3.1 (PWR/1-1-81) Emergency Power Supply for Pressurizer Heaters (Safety-Grade Interfaces)

II.E.4.1 (ALL/7-1/81) Dedicated Hydrogen Penetrations

II.E.4.2 (ALL/1-1-81) Containment Isolation Dependability

II.F.2 (PWR/1-1-81) Instrumentation for Detection of Inadequate Core Cooling

II.G.1 (PWR/1-1-81) Emergency Power for Pressurizer Equipment (Safety-Grade Interfaces)

II.K.2.10 (PWR/B&W/7-1-81) Safety-Grade Anticipatory Reactor Trip

II.K.3.9 (PWR/W/1-1-81) PID Controller Modification (If Hardware Change Involved)

II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip

II.K.3.13 (PWR/GE/7-1-81) Separation of HPCI and RCIC Initiation Signals

II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems

II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop

II.K.3.21 (BWR/GE/7-1-18) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)

II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)

Licensees whose plants were included within the NRC Systematic Evaluation Program received a Technical Evaluation Report (TER) in addition to the SER. The TER was based on a review of equipment environmental qualification documentation associated with the Licensee's EEQ submittals. The qualification deficiencies identified in the SER were derived from the TER. Plants included within this program were the Palisades, Oyster Creek, Ginna, Haddam Neck, Yankee Rowe, LaCrosse, and Big Rock Point plants and Zion Station Units 1 and 2, Indian Point Units 2 and 3, Millstone Unit 1, Dresden Unit 2, and San Onofre Unit 1. For these plants, the evaluation presented herein is based on (1) the result of the initial TER, (2) the Licensee's response to the NRC SER and the TER, and (3) the Licensee's updated EEQ submittal(s).

TERs were also developed for the following plants: Nine Mile Point Unit 1, Millstone Unit 2, Salem Unit 1, Browns Ferry Units 1, 2, and 3, Brunswick Units 1 and 2, Hatch Units 1 and 2, Dresden Unit 3, and Quad Cities Units 1 and 2. The objective of those TERs was to review the Licensee's submittals to determine if safety-related electrical equipment was reviewed for environmental qualification by the Licensee in accordance with the DOR Guidelines and NUREG-0588 as required by IE Bulletin 79-01B. For these 13 plants and all other plants, excluding the 14 plants associated with the Systematic Evaluation Program, the evaluation presented herein is based solely on (1) the Licensee's response to the NRC SER and (2) the Licensee's revised EEQ submittal(s).

This technical evaluation was conducted to identify (1) whether the Licensee provided an adequate response to the SER concerns (and TER concerns,

where applicable), (2) major deficiencies within the equipment qualification program, and (3) whether the Licensee proposed adequate corrective actions to resolve qualification deficiencies and provided a schedule for completion of the corrective actions. The TER was written primarily to address deviations from the NRC criteria and requirements. Technical data or test results that satisfy the qualification criteria are not discussed herein.

The evaluation presented in Section 4 of this report includes completed equipment environmental qualification review checksheets (partially handwritten) which compile both the technical information necessary to conduct the review and the results of the evaluation. Parameters listed on these checksheets were derived from the appropriate NRC screening criteria. The evaluation of each equipment item includes several checksheet pages. Only those checksheet pages necessary to complete the evaluation for each equipment item are included in this report. A complete listing of the checksheet pages is shown on the bottom of Checksheet 1a, reproduced here as Figure 3-1.

The checksheets contain the following information:

- Equipment item information (see Figure 3-1), for example:

  Solenoid Valve Located in Turbine Building (Area #7)
  Automatic Switch Co. (ASCO) Model LB8300B61U
  Actuates Feedwater Control Valves (V-4269, V-4270)
  Licensee Reference 839
  Required Operating Time: Short term (SI signal)
  TER Checksheet No. 1
  Reference 59, Section 4.5.2.6
  Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; SCEW 1

- Qualification deficiencies identified in the SER (see Figure 3-1)
- Licensee's response to the SER
- Licensee's statements and rationale for qualification
- Licensee's corrective action and replacement schedule
- Evaluation of qualification including identification of all deficiencies
- Evaluation of system considerations presented by the Licensee as a rationale for excluding equipment from qualification.

The results of the evaluation are summarized on Checksheet 2 (Equipment Environmental Qualification Summary Form) for each equipment item. Checksheet

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|---|---|---|

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ___

Equipment Item No. 1
Solenoid Valves Located in Turbine Building (Area #7)
Automatic Switch Co. (ASCO) Model LB8300B61U
Actuates Feedwater Control Valves (V-4269, V-4270)
Licensee Reference 1617
Required Operating Time: Short term (SI signal)
TER Checksheet No. 1
Reference 59, Section 4.5.2.6
Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; FRC SCEW 1

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, 3c, 3d |
| System Consideration Review | 4a, 4b, 4c, 4d, 4e, 4f |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j |
| Installed TMI Lessons Learned Implementation Equipment Summary | 6a, 6b |
| Maintenance and Replacement Schedule Summary | 7a, 7b, 7c |

Figure 3-1. Sample Checksheet Page 1a

"Equipment Item"

2 specifically identifies any qualification deficiencies determined by the evaluation and identifies the NRC qualification category to which the equipment item was assigned. A sample Checksheet 2 is presented in Figure 3-2.

All information was reviewed for conformance to the NRC criteria referenced in Section 2 of this report. As requested by the NRC, all applicable and available qualification documentation associated with the overall Equipment Environmental Qualification (EEQ) program was used by the reviewers, whether referenced by the Licensee or not.

Upon completion of the review for each equipment item, an overall evaluation of the component and a specific conclusion with respect to its qualification was developed. Based on the evaluation, each equipment item was assigned to one of the generic qualification categories provided by the NRC. The NRC category descriptions are presented in Section 3.3 of this report.

## 3.3 NRC QUALIFICATION CATEGORIES AND DEFINITIONS

- NRC Category I.a
  EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588, OR HAS ACCEPTABLE DEVIATIONS FROM THE DOR/NUREG CRITERIA

  This category includes equipment items which are fully acceptable on the basis that all applicable criteria defined in the DOR Guidelines or NUREG-0588 are (1) satisfied and the equipment has been found to be qualified or (2) sufficient information has been presented to determine that deviations from the criteria are acceptable or insignificant.

- NRC Category I.b
  EQUIPMENT FOR WHICH DEVIATIONS FROM THE DOR GUIDELINES OR NUREG-0588 ARE JUDGED CONDITIONALLY ACCEPTABLE PROVIDED THAT SPECIFIC MODIFICATIONS ARE MADE

  This category includes equipment items that do not satisfy one or more of the applicable criteria defined in the DOR Guidelines or NUREG-0588; however, the Licensee has stated that specific modifications will be made on or before a designated date. This equipment is considered by NRC to be conditionally acceptable provided that the specific modifications are made by the Licensee. When the modifications are completed as proposed, the Licensee states that the equipment will satisfy all applicable NRC requirements. Examples of specific modifications are (1) replacement of unqualified equipment with qualified equipment, (2) equipment hardware

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|---|---|---|

**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ___**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ___ |
| Adequate Similarity Between Equipment and Test Specimen Established | ___ |
| Aging Degradation Evaluated Adequately | ___ |
| Qualified Life or Replacement Schedule Established (If Required) | ___ |
| Program Established to Identify Aging Degradation | ___ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ___ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ___ |
| o Peak Pressure Adequate | ___ |
| o Duration Adequate | ___ |
| o Required Profile Enveloped Adequately | ___ |
| o Steam Exposure (If Required) Adequate | ___ |
| Criteria Regarding Spray Satisfied | ___ |
| Criteria Regarding Submergence Satisfied | ___ |
| Criteria Regarding Radiation Satisfied | ___ |
| Criteria Regarding Test Sequence Satisfied | ___ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ___ |
| Criteria Regarding Functional Testing Satisfied | ___ |
| Criteria Regarding Instrument Accuracy Satisfied | ___ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ___ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ___ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | ___ |
| I.b | Equipment Qualification Pending Modification | ___ |
| II.a | Equipment Qualification Not Established | ___ |
| II.b | Equipment Not Qualified | ___ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ___ |
| III.a | Equipment Exempt From Qualification | ___ |
| III.b | Equipment Not in the Scope of the Qualification Review | ___ |
| IV | Documentation Not Made Available | ___ |

Figure 3-2. Sample Checksheet Page 2

"Equipment Environmental Qualification Summary Form"

modification, (3) equipment relocation above submergence level, (4) relocation or shielding of equipment from radiation source, (5) verification of qualification by additional testing, (6) equipment relocation to a mild environment, and (7) qualification testing of equipment in progress.

- NRC Category II.a
  EQUIPMENT FOR WHICH QUALIFICATION DOCUMENTATION IS INSUFFICIENT TO ESTABLISH THAT THE EQUIPMENT IS OR IS NOT QUALIFIED IN ACCORDANCE WITH THE DOR GUIDELINES OR NUREG-0588

  The qualification of equipment items in this category, in accordance with the requirements of the DOR Guidelines or NUREG-0588, is significantly deficient or inconclusive based upon review of (1) the documentation provided by the Licensee or (2) applicable and available qualification documentation associated with the overall equipment environmental qualification program. The qualification documentation indicates significant deficiencies, which can be categorized as follows: (1) appropriate documentation reflecting qualification has not been cited and made available for review by the Licensee and there is no knowledge of applicable documentation; (2) the Licensee is awaiting qualification from the equipment vendor; or (3) the qualification documentation indicates significant deficiencies; however, where testing was conducted, no reported failures or severe anomalies were observed which would unquestionably affect the ability of the equipment to perform its design basis safety function(s).

- NRC Category II.b
  EQUIPMENT THAT IS UNQUALIFIED

  This category includes equipment items whose qualification documentation has been judged to be seriously deficient based upon review of (1) the documentation provided by the Licensee, or (2) applicable and available qualification documentation associated with the overall equipment environmental qualification program. The qualification documentation indicates serious deficiencies reported during testing; for example, severe anomalies or failure of the test specimen, which could affect the ability of the equipment to perform its safety function. NRC has requested immediate written notification when an equipment item is placed in this category during the course of the review.

- NRC Category II.c
  EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588 WITH THE EXCEPTION OF QUALIFIED LIFE

  This category includes equipment items that are acceptable on the basis that all applicable criteria defined in the DOR Guidelines or NUREG-0588 are satisfied with the exception of the qualified life criterion. The Licensee (1) has not evaluated qualified life or replacement schedule, (2) has not adequately evaluated qualified life or replacement schedule, or (3) has not adequately intepreted qualified life in terms of calendar time. [Note: The component replacement schedule discussed in Section 7.0 of the

DOR Guidelines is, in effect, a qualified life. It is not essential to use the term "qualified life," but the replacement schedule must be justified.]

- NRC Category III.a
  EQUIPMENT THAT IS EXEMPT FROM QUALIFICATION

  This category includes equipment items that are exempt from qualification on the basis that (1) the equipment does not provide a safety function (i.e., should not have been included in the equipment list submitted by the Licensee), or (2) the specific safety-related function of the equipment can be accomplished by some other designated equipment that is fully qualified and satisfies the single failure criterion. In addition, any failure of the exempt equipment must not mislead the operator or degrade the ability of qualified equipment to perform its required safety-related function.

- NRC Category III.b
  EQUIPMENT NOT IN THE SCOPE OF THE QUALIFICATION REVIEW

  This category includes equipment items addressed by the Licensee in the equipment environmental qualification submittals which are (1) required to achieve and maintain the plant in a cold shutdown condition or (2) located in a mild environment. Supplement 2 of IE Bulletin 79-01B permits deferment of the review of environmental qualification for all safety-related equipment items located in plant areas where the equipment is not exposed to the direct effects of a high energy line break (HELB) or to nuclear radiation emanating from circulation of fluids containing radioactive substances. Supplement 3 of IE Bulletin 79-01B permits deferment of the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition. Supplements 2 and 3 of IE Bulletin 79-01B originally permitted deferment until after February 1, 1981 of the qualification review of equipment located in a mild environment or required to achieve and maintain the plant in a cold shutdown condition. Since the issuance of Supplements 2 and 3, the NRC has determined that the review of environmental qualification for this equipment is not within the scope of this report.

- NRC Category IV
  EQUIPMENT FOR WHICH QUALIFICATION DOCUMENTATION HAS NOT BEEN MADE AVAILABLE FOR REVIEW

  This category includes equipment items for which qualification documentation in accordance with the requirements of the DOR Guidelines or NUREG-0588 has been cited by the Licensee as evidence of qualification; however, this documentation has not been made available for review. Therefore, a conclusion cannot be reached with respect to qualification of this equipment.

## 3.4 IMPLEMENTATION GUIDE FOR FULFILLING NRC CRITERIA

The NRC has requested that a detailed implementation guide for fulfilling NRC criteria be prepared as part of this assignment. The implementation guide will present a fully detailed discussion of the principal qualification criteria presented in the DOR Guidelines and NUREG-0588. The primary emphasis will be to clarify technical points, eliminate possible misconceptions, and clearly provide definitive guidance to enable licensees to understand and resolve, in an expeditious manner, qualification deficiencies identified as a result of this TER. The implementation guide (TER-C5257-532) has been Prepared and issued to the NRC. The implementation guide is either appended to this TER or will be forwarded to the Licensee by the NRC under a separate letter. The Licensee is encouraged to review that document.

# 4. TECHNICAL EVALUATION

## 4.1 INTRODUCTION

The technical evaluation presented in this section represents the equipment environmental qualification (EEQ) assessment for each equipment item listed in Appendix B in accordance with the methodology presented in Section 3 of this report. The evaluations were conducted to identify any major deficiencies within the Licensee's equipment qualification program and to determine whether the Licensee (1) provided an adequate response to the SER concerns, (2) proposed adequate corrective actions to resolve qualification deficiencies, and (3) provided a schedule for completion of the corrective actions.

The evaluations are based on the available qualification documentation provided by the Licensee, complemented in several cases by other relevant technical information. The major qualification deficiencies that have been identified and the results of the evaluation are shown in the Equipment Environmental Qualification Summary Forms (Tables 4-1, 4-2, 4-3, and 4-4) presented in Section 4.2.

Observations concerning the Licensee's qualification methodology presented in response to the NRC SER are presented in Section 4.3.

Technical evaluations of the environmental qualification of the equipment items are presented in Section 4.4.

## 4.2 SUMMARY OF THE EVALUATION

The following tabulations represent a summary of the results of the equipment environmental qualification evaluation conducted in accordance with the methodology presented in Section 3.

Table 4-1 summarizes the number of equipment items assigned to each NRC qualification category as a result of the evaluation.

Table 4-2 summarizes the number of equipment items found to have a specific qualification deficiency.

Table 4-3 summarizes the number of equipment items for which the Licensee has proposed a specific corrective action to resolve a qualification deficiency.

Table 4-4 consists of Equipment Environmental Qualification Summary Forms for the equipment items, identifying (1) compliance with the qualification requirements defined in Section 2, (2) the resultant NRC qualification category, and (3) the Licensee-proposed corrective action.

TABLE 4-1

NUMBER OF EQUIPMENT ITEMS IN EACH QUALIFICATION CATEGORY

| NRC CATEGORY | CATEGORY DESCRIPTION | NUMBER OF EQUIPMENT ITEMS |
|---|---|---|
| I.A | EQUIPMENT QUALIFIED<br>[ EQUIPMENT ITEM NO(S).: 15, 16, 17, 18, 20, 22, 23, 27, 29, 30, 35, 42, 43, 75, 76, 77, 78, 82, 83, 84, 85, 86 ] | 22 |
| I.B | EQUIPMENT QUALIFICATION PENDING MODIFICATION<br>[ EQUIPMENT ITEM NO(S).: 19, 21, 24, 26, 32, 33, 44, 45, 46, 47, 48, 54, 55, 56, 57, 65, 66, 67, 68, 69, 81 ] | 21 |
| II.A | EQUIPMENT QUALIFICATION NOT ESTABLISHED<br>[ EQUIPMENT ITEM NO(S).: 1, 2, 3, 4, 5, 7, 9, 10, 11, 25, 28, 34, 37, 49, 50, 60, 62, 63, 64, 70, 71, 72, 73, 79, 80, 87, 88, 89, 90, 91, 92, 93, 94 ] | 33 |
| II.B | EQUIPMENT NOT QUALIFIED | 0 |
| II.C | EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED<br>[ EQUIPMENT ITEM NO(S).: 8, 12, 13, 14, 31 ] | 5 |
| III.A | EQUIPMENT EXEMPT FROM QUALIFICATION<br>[ EQUIPMENT ITEM NO(S).: 36, 38, 40, 41, 51, 53, 58, 61, 95 ] | 9 |
| III.B | EQUIPMENT NOT IN THE SCOPE OF THE REVIEW<br>[ EQUIPMENT ITEM NO(S).: 6, 39, 52, 59 ] | 4 |
| IV | DOCUMENTATION NOT MADE AVAILABLE<br>[ EQUIPMENT ITEM NO(S).: 74 ] | 1 |
| | TOTAL | 95 |

TABLE 4-2

QUALIFICATION DEFICIENCY SUMMARY

| NRC REQUIREMENT | NUMBER OF DEFICIENT EQUIPMENT ITEMS |
|---|---|
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | 18 |
| [ EQUIPMENT ITEM NO(S).: 19, 21, 24, 25, 26, 34, 37, 44, 48, 49, 50, 60, 62, 68, 69, 81, 87, 91 ] | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | 24 |
| [ EQUIPMENT ITEM NO(S).: 1, 2, 3, 4, 5, 7, 9, 10, 11, 28, 34, 60, 63, 64, 70, 71, 79, 80, 87, 89, 90, 92, 93, 94 ] | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | 23 |
| [ EQUIPMENT ITEM NO(S).: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 34, 60, 63, 64, 65, 66, 67, 88, 93, 94 ] | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | 24 |
| [ EQUIPMENT ITEM NO(S).: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 31, 34, 60, 63, 64, 65, 66, 67, 88, 93, 94 ] | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | 1 |
| [ EQUIPMENT ITEM NO(S).: 60 ] | |
| 6. CRITERIA REGARDING AGING SIMULATION (IF REQUIRED) | 4 |
| [ EQUIPMENT ITEM NO(S).: 34, 88, 93, 94 ] | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | |
| A. - PEAK TEMPERATURE ADEQUATE | 0 |
| B. - PEAK PRESSURE ADEQUATE | 0 |
| C. - DURATION ADEQUATE | 1 |
| [ EQUIPMENT ITEM NO(S).: 94 ] | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | 0 |

Table 4-2 (Cont.)

QUALIFICATION DEFICIENCY SUMMARY

| NRC REQUIREMENT | NUMBER OF DEFICIENT EQUIPMENT ITEMS |
|---|---|
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE---------- | 0 |
| 8. CRITERIA REGARDING SPRAY SATISFIED---------- [ EQUIPMENT ITEM NO(S).: 60, 63, 64, 67 ] | 4 |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED---------- | 0 |
| 10. CRITERIA REGARDING RADIATION SATISFIED---------- [ EQUIPMENT ITEM NO(S).: 34, 60, 88, 90, 91, 93, 94, 94 ] | 7 |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED---------- | 0 |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED---------- [ EQUIPMENT ITEM NO(S).: 72, 73 ] | 2 |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED---------- | 0 |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED---------- [ EQUIPMENT ITEM NO(S).: 60 ] | 1 |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED--- | 0 |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)- | 0 |

TABLE 4-3

LICENSEE CORRECTIVE ACTION SUMMARY

| CORRECTIVE ACTION DESCRIPTION | NUMBER OF EQUIPMENT ITEMS |
|---|---|
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT [ EQUIPMENT ITEM NO(S).: 19, 21, 24, 26, 44, 45, 46, 47, 48, 54, 55, 56, 68, 81 ] | 14 |
| 2. EQUIPMENT MODIFICATION [ EQUIPMENT ITEM NO(S).: 65, 66, 67, 87 ] | 4 |
| 3. EQUIPMENT RELOCATION ABOVE SUBMERGENCE LEVEL | 0 |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | 0 |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | 0 |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | 0 |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS [ EQUIPMENT ITEM NO(S).: 32, 33, 57, 69 ] | 4 |
| 8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITEMS) | 0 |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED (SEE SPECIFIC EQUIPMENT ITEM FOR COMPLETION DATE) [ EQUIPMENT ITEM NO(S).: 19, 21, 24, 26, 32, 33, 44, 45, 46, 47, 48, 54, 55, 56, 57, 68, 69, 81, 87 ] | 19 |

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 001 | 002 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 013 | 014 | 015 | | |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | | | | | | | | | | | | | | | | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | X | X | X | X | X | X | | X | | X | X | X | | | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | | | | | | | | | | | | | | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | | | | | | | | | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | | | | | | | | | | | | | | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | | | |
| **NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)** | | | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | | | | | | | | | | | | | | | | X | |
| I.b EQUIPMENT QUALIFICATION PENDING MODIFICATION | | | | | | | | | | | | | | | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | X | X | X | X | X | | X | | X | | X | X | X | | | | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | | | | X | | | | | X | X | X | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | | | | | | | | | | | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | X | | | | | | | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | | | | |
| **CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)** | | | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | | | | | | | | | | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | | | | | | | | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | | | | | | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | | | | | | | | | | | | | | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 101 | 101 | 101 | 101 | 101 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 103 | 01 |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | | | X | | | X | | | | X | | X | | X | | | | | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | | | | | | | | | | | | | | | | X | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | | | | | | | | | | | | | | | | | | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | | | | | | | | | | | | | | | | | | | | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | | | | | | | | | | | | | | | | | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | | | | | | |
| **NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)** | | | | | | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | X | | X | | X | | | X | | | X | | X | | | | | | X | | X | | X |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | | | | | | X | | | X | | | | | X | | | | X | | | | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | | | | | | | | | | | | | | | | X | | | | X | | | | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | | | | | | | | | | | | | | | | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | | | | | | | | | | | | | | | | | | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | | | | | | | | | | | | | | | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | | | | | | | | | | | |
| **CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)** | | | | | | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | X | | | X | | | | X | | | X | | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | | | | | | | | | | | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | | | | | | | | | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | | | X | | | X | | | | X | | | X | | | | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 | 1042 | 1043 | 1044 | 1045 |
| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | | | | | | | | | | | | | | | |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | | | X | | | X | | | | | | | X | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | | | X | | | | | | | | | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | | X | | | | | | | | | | | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | X | | | X | | | | | | | | | | | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | X | | | | | | | | | | | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | | | | | | | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | X | | | | | | | | | | | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | |
| NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY) | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | | | | | X | | | | | | | X | X | | |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | | X | X | | | | | | | | | | | X | X |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | | | | X | | | X | | | | | | | | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | X | | | | | | | | | | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | | X | | X | | X | X | | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | | | | X | | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | | |
| CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED) | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | | | | | | | | | | | X | X |
| 2. EQUIPMENT MODIFICATION | | | | | | | | | | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | X | X | | | | | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | X | X | | | | | | | | | | | X | X |

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | | | | | |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | | X | | X | | X | | | | | | | | | | | | X | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | | | | | | | | | | | | | | | | | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | | | | | | | | | | | | | | | | | X | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | | | | | | | | | | | | | | | | | | | X | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | | | | | X | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | | | | | | | | | | | | | | | | X | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | | | | | | | | | | | | | | | X | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | | | | | X | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | | | | | | | | | | | | | | | | X | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | | | | | X | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | | | | | | |
| **NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)** | | | | | | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | | | | | | | | | | | | | | | | | | | | |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | X | | X | | X | | | | | | X | | X | | X | | X | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | | | | | | X | | X | | | | | | | | | | | X | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | | | | | | | | | | | | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | | | | X | | | X | | | | | | X | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | | X | | | | | | | | | | | X | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | | | | | | | |
| **CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)** | | | | | | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | X | | X | | X | | | | | | X | | X | | X | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | | | | | | | | | | | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | | | | | | | | X | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | X | | X | | X | | | | | | X | | X | | X | | X | | | |

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 | 1072 | 1073 | 1074 | 1075 | | | | | |
| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | | | | | | | | | | | | | | | | | | | | |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | X | | | | | | X | | X | | | | | | | | | | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | | | | | | | | | | | | | | | | | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | X | X | X | X | X | | X | | X | | | | | | | | | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | | | X | X | X | X | X | | X | | X | | | | | | | | | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | | | | | | | | | | | | | | | | | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | X | X | | | X | | | | | | | | | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | X | | X | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | | | | | | |
| NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY) | | | | | | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | | | | | | | | | | | | | | | X | | | | | |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | | | | | X | X | X | X | X | | | | | | | | | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | | X | X | X | | | | | | X | X | X | X | | | | | | | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | | | | | | | | | | | | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | X | | | | | | | | | | | | | | | | | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | | | | | | | | | | | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | X | | | | | | |
| CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED) | | | | | | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | | | | | X | | | | | | | | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | X | X | X | | | | | | | | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | | | | | X | | | | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | | | | | | | X | X | | | | | | | | | | | |

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 076 | 077 | 078 | 079 | 080 | 081 | 082 | 083 | 084 | 085 | 086 | 087 | 088 | 089 | 090 | | | |
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | | | | | | X | | | | | | X | | | | | | |
| 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | | X | X | | | | | | | | X | | X | X | | | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | | | | | | | | | | | X | | | | | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | | | | | | | | | | | | | X | | | | | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | | | | | | | | | | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | | | | | | | | | | | X | | | | | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | | | | | | | | | | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | | | | | | | | | | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | | | | | | | | | | | | | | |
| C. - DURATION ADEQUATE | | | | | | | | | | | | | | | | | | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | | | | | | | | | | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | | | | | | | | | | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | | | | | | | | | | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | | | | | | | | | | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | | | | | | | | | | | | | | | | | | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | | | | | | | | | | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | | | | | | | | | | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | | | | | | | | | | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | | | | | | | | | | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | | | | | | | | | | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | | | | | | | | | | | | | | |
| **NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)** | | | | | | | | | | | | | | | | | | |
| I.A EQUIPMENT QUALIFIED | X | | X | | X | | | | | A | | X | | | X | | X | |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | | | | | | | | X | | | | | | | | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | | | | X | | X | | | | | | | X | | X | | X | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | | | | | | | | | | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | | | | | | | | | | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | | | | | | | | | | | | | | |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | | | | | | | | | | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | | | | | | | | | | | | | | |
| **CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)** | | | | | | | | | | | | | | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | | | X | | | | | | | | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | | | | | | | | X | | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | | | | | | | | | | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | | | | | | | | | | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | | | | | | | | | | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | | | | | | | | | | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | | | | | | | | | | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | | | | | | | | | | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | | | | | X | | | | | | X | | | | | | |

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICAYION SUMMARY FORM

| NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS 091 | 092 | 093 | 094 | 095 |
|---|---|---|---|---|---|
| 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE | X | | | | |
| 2. ADEQUATE SIMILARTIY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED | | X | X | X | |
| 3. AGING DEGRADATION EVALUATED ADEQUATELY | | | X | X | |
| 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) | | | X | X | |
| 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION | | | | | |
| 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) | | | X | X | |
| 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: | | | | | |
| A. - PEAK TEMPERATURE ADEQUATE | | | | | |
| B. - PEAK PRESSURE ADEQUATE | | | | | |
| C. - DURATION ADEQUATE | | | | X | |
| D. - REQUIRED PROFILE ENVELOPED ADEQUATELY | | | | | |
| E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE | | | | | |
| 8. CRITERIA REGARDING SPRAY SATISFIED | | | | | |
| 9. CRITERIA REGARDING SUBMERGENCE SATISFIED | | | | | |
| 10. CRITERIA REGARDING RADIATION SATISFIED | X | | X | X | |
| 11. CRITERIA REGARDING TEST SEQUENCE SATISFIED | | | | | |
| 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED | | | | | |
| 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED | | | | | |
| 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED | | | | | |
| 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED | | | | | |
| 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1) | | | | | |
| **NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)** | | | | | |
| I.A EQUIPMENT QUALIFIED | | | | | |
| I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION | | | | | |
| II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED | X | X | X | X | |
| II.B EQUIPMENT NOT QUALIFIED | | | | | |
| II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED | | | | | |
| III.A EQUIPMENT EXEMPT FROM QUALIFICATION | | | | | X |
| III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW | | | | | |
| IV DOCUMENTATION NOT MADE AVAILABLE | | | | | |
| **CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)** | | | | | |
| 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT | | | | | |
| 2. EQUIPMENT MODIFICATION | | | | | |
| 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL | | | | | |
| 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE | | | | | |
| 5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS | | | | | |
| 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT | | | | | |
| 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS | | | | | |
| 8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___) | | | | | |
| SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED | | | | | |

## 4.3 METHODOLOGY USED BY THE LICENSEE

This section includes observations concerning the Licensee's qualification methodology presented in the response [11] to the NRC SER.

### 4.3.1 Completeness of Safety-Related Equipment List

Section 3.1 of the NRC SER [10] identified the following concern:

"Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was identified by the licensee and is also presented in Appendix D. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures appears to have been provided. Instrumentation which is not considered to be safety-related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review.

The licensee identified 251 items of equipment which were assessed by the staff."

### 4.3.2 Containment Spray System

Section 3.2 of the NRC SER [10] identified the following concern:

"On this basis, the staff has assumed, unless otherwise noted, that the analysis for developing the environmental envelopes for the Millstone Unit 2 plant, relative to the temperature, pressure, and the containment spray caustics, has been performed in accordance with the requirements stated above. The staff has reviewed the qualification documentation to ensure that the qualification specifications envelope the conditions established by the licensee. During this review, the staff assumed that for plants designed and equipped with an automatic containment spray system which satisfies the single-failure criterion, the main-steam-line-break (MSLB) environmental conditions are enveloped by the large-break-LOCA environmental conditions. The staff assumed, and requires the licensee to verify, that the containment spray system is not subjected to a disabling single-component failure and therefore satisfies the requirements of Section 4.2.1 of the DOR guidelines."

The Licensee has not provided a reply to the NRC request.

## 4.3.3 Environmental Service Conditions

### 4.3.3.1 Temperature, Pressure, and Humidity Conditions Inside Containment

Section 3.3 of the NRC SER [10] identified the following concern:

"The licensee has provided the results of accident analyses as follows:

| | Max Temp (°F) | Max Press (psig) | Humidity (%) |
|---|---|---|---|
| LOCA | 279 | 51.7 | 100% |
| MSLB | not provided | not provided | not provided |

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for higher-than-average temperatures in the upper regions of the containment that can exist due to stratification, especially following a postulated MSLB. Use of the steam saturation temperature corresponding to the total building pressure (partial pressure of steam plus partial pressure of air) versus time will provide an acceptable margin for either a postulated LOCA or MSLB, whichever is controlling, as to potential adverse environmental effects on equipment.

The licensee's specified temperature (service condition) of 279°F does not satisfy the above requirement. A saturation temperature corresponding to the peak profile (299°F peak temperature at 51.7 psig) should be used instead. The licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not meet the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action."

The Licensee responded to the NRC concern as follows [11]:

"B.1 CONTAINMENT PROFILES, TEMPERATURE AND PRESSURE

The information presented in Reference (32) is duplicated below:

> 'The design basis temperature and pressure conditions for Millstone Unit No. 2 results from a postulated LOCA. The MSLB accident was also evaluated and although a comparable peak value was calculated, the duration of the transient was found to be shorter and the LOCA remains limiting. The profiles utilized in the qualification effort were based upon FSAR analyses, have been provided in earlier revisions of this report, and are presented in Appendix II. The analytical methodology employed to develop these profiles is consistent with applicable NRC requirements.'

In Reference (42), the Staff alleged that insufficient information was provided to substantiate the validity of the values specified. NNECO has

subsequently been informed that the basis for the Staff position was that the values utilized did not satisfy the Staff's 'screening criteria', as defined in the July 7-10 meeting.

NNECO responded to these alleged deficiencies in Reference (43). Although Reference (43) was docketed approximately one month prior to the issuance of Reference (44), Reference (44) is identical in content to Reference (42) with respect to temperature and pressure inside containment. This suggests to NNECO that the Staff either failed to review or failed to understand Reference (43). Reference (43) continues to constitute NNECO's response and reiterates that 279°F and 51.7 psig remain the qualification limits. The methods used to arrive at these results are in full conformance with the provisions of NUREG-0588 and DPR-65.

B.4 ENVIRONMENTS - HUMIDITY, INSIDE CONTAINMENT

The information in Reference (32) is duplicated below:

> 'The relative humidity of the air surrounding the Category 1 equipment has been conservatively assumed to be 100% for the duration of the elevated temperature and pressure condition resulting from a LOCA or a HELB unless otherwise noted in the System Component Evaluation Work Sheets (SCEWS) in Appendix II. Additionally, it is assumed that the entire compartment associated with HELB instantly saturates with steam, even though the Category 1 equipment may be separated by long distances and torturous pathways from the HELB. This approach assures that an appropriate level of conservatism has been employed in this evaluation.'

The Staff did not identify any concern with this approach.

B.8 MARGIN

On several occasions during the course of the July 7-10 meeting, the Staff raised questions and concerns regarding the adequacy of the margin available for the various parameters involved in the qualification process. To supplement the information provided in this report, NNECO's general treatment of the margin question is summarized as follows.

For the vast majority of parameters and components evaluated, there exists a substantial margin between the minimum acceptable value based upon a plant-specific evaluation and the qualified value of the component in question. Availability of this margin is typical of many aspects of plant design and operation, and is indicative of the conservatism available in the design of the facility. Further, NNECO notes that the methodology utilized to develop the minimum acceptable qualification parameter limits includes sufficient conservatism to obviate further arbitrary conservatism. The methodology used is quite distinct from the technique of calculating a best-estimate value, in which case it would be

appropriate to add some arbitrary conservatism to the final result of this calculation.

The details of the methods used are presented in these sections of this report which address the individual qualification parameters. Examples of this concept include:

- Submergence - The calculation included the entire inventory of all credible water sources available on-site.
- Radiation - A source term representative of an extremely degraded core, as specified in the DOR Guidelines, was assumed.
- Chemical Spray - The maximum available boric acid concentration, some 680 ppm higher than the Technical Specification minimum value for the RWST, was assumed.

NNECO therefore concludes that it is not necessary to impose additional margin beyond the conservatively calculated qualification values to assure that safety-related electrical equipment will perform its design function when exposed to a harsh environment."

It appears that the Licensee has responded to the NRC concern. Since the Licensee is responsible for identifying the environments, the parameters identified by the Licensee have been used in the evaluations contained in this Technical Evaluation Report. These parameters are reproduced in Appendix A.

4.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment

Section 3.4 of the NRC SER [10] stated the following:

"The licensee has provided the temperature, pressure, humidity, and applicable environment associated with an HELB outside containment. The following areas outside containment have been addressed:

(1) West main steam isolation valve room
(2) East main steam isolation valve room
(3) Turbine building elevation 14 ft 6 in and elevation 54 ft 6 in
(4) Auxiliary building elevation 36 ft 6 in
(5) Electrical penetration room (auxiliary building elevation 14 ft 6 in)

The staff has verified that the parameters identified by the licensee for the MSLB are acceptable."

In response to this concern, the Licensee stated [11]:

"B.7 AREAS OUTSIDE CONTAINMENT

The information presented in Reference (32) is duplicated below:

> 'The design basis temperature and pressure conditions for areas outside containment were provided in earlier revisions of this report and are presented in Appendix II. FSAR analyses, as amended, served as the basis for the calculation of the temperature and pressure environments.'

In Section 3.4 of References (42) and (44), the Staff concluded that the temperature, pressure, and humidity parameters previously specified are acceptable. The submergence parameter was addressed in Section B.3."

4.3.3.3 Nuclear Radiation Dose (Inside and Outside Containment)

Section 3.8 of the NRC SER [10] identified the following concern:

"The licensee has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the licensee as part of the NRC staff criteria contained in the DOR guidelines, in NUREG-0588, and in the guidance provided in IEB-79-01B, Supplement 2. Therefore, for this review, the staff has assumed that, unless otherwise noted, the values provided have been determined in accordance with the prescribed criteria. The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the licensee.

The value required by the licensee inside containment is an integrated dose ranging between $9.4 \times 10^6$ to $1.5 \times 10^8$ rads. This value does not envelope the DOR guideline requirements ($4 \times 10^7$ rads) and therefore is not acceptable. The radiation service condition provided by the licensee is lower than provided in the guidelines for gamma and beta radiation. The licensee is requested to either provide justification for using the lower service condition or use the guidelines for both gamma and beta radiation. If the former option is chosen, then the analysis--including the basis, assumptions, and a sample calculation--should be provided.

A required value outside containment of $3.12 \times 10^6$ rads has been used by the licensee to specify limiting radiation levels for the safety injection pump motors. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines and is therefore acceptable."

In response to this concern, the Licensee stated [11]:

"B.2 ENVIRONMENTS - RADIATION PROFILES

The information presented in Reference (32) is duplicated below:

> 'By letter dated December 31, 1979, Northeast Nuclear Energy Company (NNECO) docketed the results of calculations performed to ascertain the radiation service conditions resulting from a design basis accident. The methodology employed was consistent with the criteria promulgated by the NRC in NUREG-0578, and is thoroughly discussed in the December 31, 1979 submittal. Results for the 40-year normal operating dose, the LOCA dose, and the total dose were presented. These results remain applicable and are listed on the System Component Evaluation Work Sheets (SCEWS) of Appendix II as appropriate.'

In Reference (42), the Staff requested additional information to justify the use of values less than the Staff's 'screening criteria.' NNECO submitted in Reference (43) a detailed and comprehensive response including the bases, assumptions, calculations, and results to substantiate the validity of the values utilized in the qualification process. It was noted there that the Reference (42) criterion for equipment inside containment was more severe than the values specified in the DOR Guidelines or NUREG-0588.

Despite the level of detail provided in Reference (43), the Staff did not even acknowledge receipt of this material in Reference (44). Inasmuch as the methodology utilized to calculate radiation service conditions is in full conformance to the DOR Guidelines, NNECO concludes that the Reference (43) information constitutes a satisfactory response to Reference (44). If the Staff disagrees with this conclusion, we request that the Staff first review Reference (43) before rendering its views in the supplemental SER."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.4 Chemical Spray

Section 3.6 of the NRC SER [10] stated the following:

"The licensee's FSAR value for the chemical concentration is less than 2400 ppm boron. Based on the staff review of the licensee's evaluation work sheets, the staff concludes that the qualification testing for containment spray conditions adequately envelopes the above value and is therefore acceptable."

In response to this concern, the Licensee stated [11]:

"B.5 ENVIRONMENTS - CHEMICAL SPRAY

The information presented in Reference (32) is duplicated below:

'Equipment subject to harsh chemical environments due to actuation of the containment spray system is identified on the System Component Evauation Work Sheets (SCEWS). The operation of this system is detailed in the Millstone Unit No. 2 FSAR, Section 6.4. The composition of the spray is less than 2400 ppm boron as derived from the Refueling Water Storage Tank.'

The Staff concluded this approach was acceptable in References (42) and (44)."

4.3.5 Submergence

Section 3.5 of the NRC SER [10] identified the following concern:

"The maximum submergence levels have been established and assessed by the licensee. Unless otherwise noted, the staff assumed for this review that the methodology employed by the licensee is in accordance with the appropriate criteria as established by Commission Memorandum and Order CLI-80-21.

The licensee's value for maximum submergence is 8.1 ft above the containment floor. Equipment below this level has been identified by the licensee, along with the proposed corrective action. The licensee identified one safety-related electrical component (containment sump level transmitter, item number 16-C) as having the potential for becoming submerged after a postulated event. The licensee stated that the vendor qualification testing is still in progress and that the final test report will be evaluated by October 1981. Although the licensee is committed to provide a fully qualified component by June 30, 1982, the licensee is required to supplement the information presented and justify the adequacy of the design on an interim basis. The staff will review the licensee's response and include the resolution of this item in a supplemental report.

It is not clear from the information submitted that submergence of safety-related electrical equipment outside of containment was addressed. The licensee should address this area more specifically in the 90-day response and upgrade the CES as appropriate."

In response to this concern, the Licensee stated [11]:

"B.3 ENVIRONMENTS - SUBMERGENCE

The information presented in Reference (32) is duplicated below:

'In previous docketed correspondence submitted in response to I&E Bulletin No. 79-01, as amended and supplemented, the appropriate

submergence value for Millstone Unit No. 2 was identified and utilized. A conservative representation of the maximum inventory which could result from a LOCA was identified to be 88,000 cubic feet. This corresponds to a depth of water of 8.1 feet above the containment floor. This value is utilized as appropriate on the System Component Evaluation Work Sheets (SCEWS) in Appendix II.'

The Staff concerns identified in Reference (44) are identical to those contained in Reference (42). Again, NNECO's detailed response was provided in Reference (43) and the Staff apparently failed either to review or understand NNECO's response. NNECO reiterates the following significant points of Reference (43):

- o Submergence levels inside containment were determined using very conservative assumptions.

- o Reference (30) states that 'qualification documentation for TMI Action Plan equipment not yet installed which does not require pre- implementation review should be submitted to NRC for review by the implementation date.' Thus it is inconsistent with Reference (30) and misleading to require NNECO 'to supplement the information presented and justify the adequacy of the design on an interim basis', prior to the due date for submittal of any documentation associated with this TMI Action Plan item.

- o The potential for submergence outside containment was thoroughly evaluated in the FSAR and summarized in Reference (43).

NNECO concludes that the Reference (43) information is responsive to the Staff concerns."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.6 Aging and Qualified Life

Section 3.7 of the NRC SER [10] identified the following concern:

"The DOR Guidelines, section 7, does not require a qualified life to be established for all safety related electrical equipment, however the following actions are required:

1. Detailed comparison of existing equipment to the materials identified in Appendix C of the DOR guidelines. The first supplement to IEB-79-01B requires the licensees to utilize the table and identify any additional materials as a result of their effort.

2. Establish an ongoing program to review surveillance and maintenance records to identify potential age related degradations.

3. Establish component maintenance and replacement schedules which include considerations of aging characteristics of the installed components.

The licensee identified a number of equipment items for which a specified qualified life was established (for example, 4.4 years or 40 years). In its assessment of these submittals, the staff did not review the adequacy of the methodology nor the basis used to arrive at these values; the staff has assumed that the established values are based on state-of-the-art technology and are acceptable.

For this review, however, the staff requires that the licensee submit supplemental information to verify and identify the degree of conformance to the above requirements. The response should include all the equipment identified as required to maintain functional operability in harsh environments.

The licensee indicated that this phase of the response is outstanding and that the review is in progress. The staff will review the licensee's response when it is submitted and discuss its evaluation in a supplemental report."

In response to this concern, the Licensee stated [11]:

"B.6 ENVIRONMENTS - AGING - SURVEILLANCE AND PREVENTIVE MAINTENANCE PROGRAMS

The information presented in Reference (32) is duplicated below:

'Equipment which is subjected to harsh environments caused by a LOCA or High Energy Line Breaks (HELB) and which must operate to mitigate the consequences of those accidents is required to be environmentally qualified. Part of this qualification requires that the equipment be shown to operate successfully in an end-of-life condition.

To address this question, NUSCO has retained Wyle Laboratories to perform aging analysis for components which fall into this category.

Normal radiation and temperature data were obtained from plant operating records and from in-service surveys conducted during the summer of 1980. Operating temperature surveys were performed during the hottest days of 1980 in the areas surrounding the Category I equipment and this information represents the Normal Maximum Temperature that the equipment would be subjected to throughout its design life. Additional conservatism was added in the aging analysis by assuming that the equipment would be exposed continually to these

temperatures, giving no credit to seasonal and operational differences in ambient temperatures.

Identification of age sensitive components within the equipment is made increasingly more difficult with increasing age of the equipment. Although the analysis is not yet complete, there remains a high degree of confidence that the results will yield a satisfactory qualified life for components identified in the System Component Evaluation Work Sheets (SCEWS). In conformance with the Commission's May 23, 1980 Order, NUSCO has committed to a program of replacement, where this information is determined to be lacking. Additionally, justification for continued operation is included to provide the Staff full and complete information in accordance with the Order.'

Since the docketing of Reference (32), significant progress has been made towards resolution of the aging question and updates to individual SCEWS are included in Appendix 1I as a result of data obtained from our consultant, Wyle Laboratories, and other sources. In response to the verbal Staff guidance at the July 7 - 10 meetings, we have summarized below NNECO's Surveillance and Preventive Maintenance Program which addresses safety-related electrical equipment in harsh environments. In conjunction with the data on individual components indicated on the SCEW Sheets which describe the methodology used to determine expected life, NNECO concludes that the attached program fully complies with NRC requirements, as clarified by the Staff.

MILLSTONE UNIT NO. 2

PREVENTIVE MAINTENANCE PROGRAM
ELECTRICAL, INSTURMENTATION AND CONTROL EQUIPMENT

The responsibility for Maintenance of Electrical, Instrumentation and Control Equipment is split among 3 entities at Millstone Unit 2. They are the Maintenance Department, Instrumentation and Control Department and the Production Test Department. For those equipments which are committed to be periodically maintained in the Safety Technical Specifications, and additional group, the Quality Control Department, has the responsibility to insure that the work is accomplished by the proper entity. For any given equipment type, a lead discipline is assigned and support is requested for the remaining groups as required in the maintenance of that device. There is also an In-Service Inspection Team at Millstone Unit 2, which is responsible for the operability of mechanical devices such as valves, pumps, and piping. The drivers for the valves and pumps are not in this group's jurisdiction. However, should the tolerance of the mechanical device be exceeded, it may well be a problem with the Electrical Instrumentation and Control equipment. In that case the proper maintenance group would be called for assistance.

RESPONSIBILITIES

1. The Unit 2 Maintenance and Instrument and Control Supervisors are responsible for ensuring that equipment assigned to their department is maintained, calibrated and tested to insure continued operability.

2. The NUSCO Production Test Field Supervisor is responsible for ensuring that equipment assigned to the NUSCO Production Test Department is maintained, calibrated and tested to insure continued operability.

3. The Unit 2 Superintendent is responsible for resolving any differences and making appropriate assignments to insure that the Unit electrical equipment is maintained, calibrated and tested to insure continued operability.

The following table defines the area of responsibility for the Maintenance, Instrumentation and Control and Production Test Departments.

| ITEM | LEAD RESPONSIBILITY |
|---|---|
| 1. Generators (Main and Diesel) | Production Test |
| 2. Motor Testing (all motors up to 7KV) | Maintenance |

| | ITEM | LEAD RESPONSIBILITY |
|---|---|---|
| 3. | Protective Relay Calibration and Trip Testing | Production Test |
| 4. | Transformer Testing | |
| | a. Inside Transformers | Maintenance |
| | b. Outside Transformers | Production Test |
| 5. | Emergency Power Systems - Includes DG Electrical Controls, Batt. Chargers | Maintenance |
| 6. | Plant Power Metering Calibration | Production Test |
| 7. | Transducer Calibration | Production Test |
| 8. | 480/120/125 Volt Switchgear | Maintenance |
| 9. | Batteries | Maintenance |
| 10. | Main Generator Excitation and Voltage Regulator | Production Test |
| 11. | Electrical Testing of Modification | |
| | a. NUSCO Projects | Production Test |
| | b. NNECO Projects | Maintenance |
| 12. | CEDM System | |
| | a. MG Set Motor and Generator | Maintenance |
| | b. MG Set Control Cabinet including Protection, Starter, and Regulator | Production Test |
| | c. Trip Switchgear Cubicles/Busses/ Breakers | Maintenance |
| | d. Trip Switchgear Protection, Relaying and Wiring from RPS to Switchgear to Breakers | Production Test |
| | e. RPS Cabinets and Sensors | Instrumentation and Controls |
| 13. | Pressurizer Heater Proportional Controllers | Maintenance |
| 14. | Vital Power Systems; Computer Power Supply and Inverters/Static Switches | Maintenance |
| 15. | Refueling Equipment | Maintenance |

| ITEM | LEAD RESPONSIBILITY |
|---|---|
| 16. 4 KV/7 KV Switchgear | Maintenance |
| a. Breakers/Buswork | Maintenance |
| b. Control/Protection on Feeders/Ties | Production Test |

MAINTENANCE DEPARTMENT

The Maintenance Department has a computerized listing of all the equipment for which they have lead responsibility. This listing includes the equipment number, preventive maintenance procedure reference, frequency of preventive maintenance, schedule for the preventive maintenance and definition of type of preventive maintenance to be performed.

INSTRUMENTATION AND CONTROL DEPARTMENT

The Millstione Unit 2 Instrumentation and Controls Department utilizes the computer run developed by the architect engineer (MS-60) in conjunction with a manual filing system to assure all preventive maintenance and calibration is performed on schedule.

PRODUCTION TEST

The Production Test Department maintains a file on all of the equipment for which they have lead responsibility. Each equipment type has an approved procedure for maintenance and calibration of that device.

REPLACEMENT OF THE MS-60 LISTING

A new computerized listing is in the process of being developed for the Instrumentation and Control Department. It will be an interactive program which will allow the engineers and technicians to sort the list by any one of a number of parameters. Provisions are being made for inclusion of Preventive Maintenance and Environmental Qualification information. Once operational, the program may be used by Maintenance and Production Test to encode their records.

INCORPORATION OF ENVIRONMENTAL QUALIFICATION INFORMATION

The July 7 - 10, 1981 meeting with the NRC Staff revised our understanding of the term 'Qualified Life'. IE Bulletin 79-01B required NNECO to determine the 'Qualified Life' for each equipment item which is required to function in a harsh environment. This information is presented on the system component evaluation work sheet. Prior to the meeting it was understood that where qualified life exceeded plant life no specific maintenance was to be required for equipment environmental qualification. Subsequently the Staff verbally requested NNECO to include all harsh environment equipment in their surveillance and

maintenance programs to verify calculations and/or detect unexpected age related degradations. This is due to the technical uncertainties that exist in the scientific community regarding prediction of aging mechanisms.

Table 1 list the Generic Equipment Items at Millstone Unit 2 which will be included in this program. Included in the Table is the surveillance required and the schedule for each preventive maintenance item.

The majority of the surveillance and preventive maintenance which is done on this equipment is currently performed on a periodic basis. However, there are a few items, such as terminal blocks, where new surveillances will be added to the procedures to address these unknown aging mechanisms.

For equipment items which contain numerous samples in similar normal environments, such as cable, penetrations and terminal blocks, representative samples will be tested on a periodic basis.

The Surveillance and Preventive Maintenance Procedures contain visual inspections, where applicable, to observe any indications of postulated aging degradations. In those equipment where accelerated pre-aging was included in the harsh environment testing program, such as with cable and splices, visual inspection may be the only surveillance performed on a regular basis.

A program to ensure that data are available for trending and data are collected for all Harsh Environment Equipment will be in full force by June 30, 1982.

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

MILLSTONE UNIT 2

TABLE 1

SURVEILLANCE AND PREVENTIVE MAINTENANCE OF EQUIPMENT

LOCATED IN A HARSH ENVIRONMENT

(TESTS WHICH VERIFY AGING ANALYSIS)

| Generic Equipment | Surveillance (Preventive Maintenance) | Period |
|---|---|---|
| 4 KV Motors | IR Test | Each refueling |
| | Hi-Pot Test | Each refueling |
| 480 volt Motors | IR Test | Each refueling |
| Motor Operators (MOV's) | IR Test | See Note 1 |
| | Operation Time | See Note 2 |
| Solenoid Valves | Qualified SV's are replaced well before they reach their qualified life. Inspections of replaced SV's IR, minimum pick-up voltage and maximum drop out voltage will verify assumptions used in aging analysis. | Three (3) years |
| Limit Switches | Visual Inspection | Two (2) years |
| | Replace gaskets | Two (2) years |
| Cable and Terminations | | |
| 4 KV Power | IR Test | Each refueling |
| | Hi-Pot Test | Each refueling |
| Cable and Terminations | | |
| LV Power<br>Control<br>Instrumentation | Visual Inspection | Ten (10) years |
| Penetrations | Leak Rate | Each Refueling |
| | IR Test | Ten (10) years |

| Generic Equipment | Surveillance (Preventive Maintenance) | Period |
|---|---|---|
| Misc. Terminations | IR Test | Ten (10) years |
| (See Note 5) | Visual Inspection | Ten (10) years |
| Hydrogen Recombiner | IR Test | See Note 4 |
| | Rated Power Test | |
| Instrumentation | | |
| Transmitters | Calibration Runs | Each Refueling |
| Radiation Detector | | |
| Accellerometer | | |
| Pre-Amp | | |
| Pressure Switches | | |
| RTD's | | |

NOTES

Note 1

A rolling schedule will be maintained such that all MOVs are fully inspected at least once every five (5) years.

Note 2

Valve stroke time is verified in the in-service inspection program and not necessarily done during refueling outage.

Note 3

IR test of terminations may be done as part of overall system test.

Note 4

These tests are conducted as part of the surveillance requirements contained in the Safety Technical Specifications, Specification 4.6.4.2. They are performed during each refueling outage.

Note 5

For termination sytems where accelerated aging was not included as part of the harsh environment test program, IR Testing will be incorporated into the surveillance procedure."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

## 4.4 EQUIPMENT ENVIRONMENTAL QUALIFICATION EVALUATION

The evaluation presented in this section of the report includes, for each equipment item, completed equipment environmental qualification review checksheets (partially handwritten) which present both the technical information necessary to conduct the review and the results of the evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
MILLSTONE 2

| FRC ITEM NO. | COMPONENT | MANUFACTURER | MODEL NUMBER | LOCATION |
|---|---|---|---|---|
| 1 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | WEST PIPE PENETRATION ROOM, ELEV. 5 |
| 2 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | WEST PIPE PENETRATION ROOM, ELEV. 5 |
| 3 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 4 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 5 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | CONTAINMENT, ELEV. 1'6" |
| 6 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 25'6", ZO |
| 7 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 25'6", ZO |
| 8 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 9 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 5'0", ZON |
| 10 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | WEST PIPE PENETRATION ROOM, ELEV. 5 |
| 11 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 12 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | WEST VALVE ROOM, ELEV. 38'6", ZONE |
| 13 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | EAST VALVE ROOM, ELEV. 38'6", ZONE |
| 14 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | TURBINE BUILDING, ELEV. 14'6", ZONE |
| 15 | SOLENOID VALVE | ASCO | NP8320A183E | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 16 | SOLENOID VALVE | ASCO | NP8320A185V | CONTAINMENT, ELEV. 8'6" |
| 17 | SOLENOID VALVE | ASCO | NP8320A177E | AUXILIARY BUILDING, ELEV. 45'6", LP |
| 18 | SOLENOID VALVE | ASCO | NP8321A5E | AUXILIARY BUILDING, ELEV. 5'0", ZON |
| 19 | SOLENOID VALVE | ASCO | WPHTX8320A184 | AUXILIARY BUILDING, ELEV. 36'6" AND |
| 20 | SOLENOID VALVE | ASCO | NP8321A6E | AUXILIARY BUILDING, ELEV. 45'6", LP |
| 21 | SOLENOID VALVE | ASCO | HPX8211B548W | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 22 | SOLENOID VALVE | ASCO | NP831655E | AUXILIARY BUILDING, ELEV. 5'0" |
| 23 | SOLENOID VALVE | ASCO | NP831655E | AUXILIARY BUILDING, ELEV. 45'6" |
| 24 | SOLENOID VALVE | ASCO | HT8211D4 | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 25 | SOLENOID VALVE | ASCO | ND | AUXILIARY BUILDING, ELEV. 45'6", LP |
| 26 | SOLENOID VALVE | ASCO | HT834481 | TURBINE BUILDING, ELEV. 14'6", ZONE |
| 27 | SOLENOID VALVE | ASCO | NP8344B58V | CONTAINMENT, ELEV. 38'6" |
| 28 | SOLENOID VALVE | ASCO | 2003816RF | CONTAINMENT, ELEV. 8'6" |
| 29 | SOLENOID VALVE | ASCO | NP2063816F | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 30 | SOLENOID VALVE | ASCO | 2063813RVU | CONTAINMENT |
| 31 | SOLENOID VALVE | VALCOR | V52660423A/V52660433A | CONTAINMENT, ELEV. 38'6" |
| 32 | AMPLIFIER | UNHOLTZ-DICKIE | 22CAZTR | CONTAINMENT, ZONE C-5 |
| 33 | ACCELEROMETER | ENDEVCO | 2273AM20 | CONTAINMENT, ZONE C-5 |
| 34 | RADIATION DETECTOR | GENERAL ATOMIC | RD23 | CONTAINMENT, ELEV. 18'6" |
| 35 | ELECTRICAL CONNECTOR | IDEAL | 30210/30211 | VARIOUS LOCATIONS INSIDE CONTAINMEN |
| 36 | FLOW TRANSMITTER | FOXBORO | E13DH | AUXILIARY BUILDING, ELEV. 25'6", FI |
| 37 | FLOW TRANSMITTER | GENERAL ELECTRIC | 555 | AUXILIARY BUILDING, ELEV. 25'6", FI |
| 38 | RTD | ROSEMOUNT | 104ADA | CONTAINMENT, ELEV. 3'6", FIRE ZONE |
| 39 | RTD | ROSEMOUNT | 108MB42BR | AUXILIARY BUILDING, ELEV. 25'6", FI |
| 40 | RTD | ROSEMOUNT | 104HC8BAX | CONTAINMENT, ELEV. 38'6", FIRE ZONE |
| 41 | ELECTRICAL INDICATOR | GENERAL ELECTRIC | 180 | TURBINE BUILDING, ELEV. 14'6", FIRE |
| 42 | ELECTRICAL CONDUCTOR MODULES | CONAX | N1100132/N1100133 | CONTAINMENT |
| 43 | ELECTRICAL CONNECTOR | LITTON | C1R06V12015S/C1R02V12015P | CONTAINMENT, ELEV. 38'6" |
| 44 | PRESSURE SWITCH | CUSTOM COMPONENT | CCS604GR6356S | ZONE T11 |
| 45 | PRESSURE TRANSMITTER | FOXBORO | E11 | CONTAINMENT, ELEV. 7'0" |
| 46 | PRESSURE TRANSMITTER | FOXBORO | NE11GM11C1LCF | AUXILIARY BUILDING, ELEV. 5'0", ZON |
| 47 | PRESSURE TRANSMITTER | FOXBORO | E11DM | AUXILIARY BUILDING, ELEV. 5'10", ZO |
| 48 | PRESSURE TRANSMITTER | GE/MAC | 551 | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 49 | PRESSURE TRANSMITTER | GENERAL ELECTRIC | 551 | TURBINE BUILDING, ELEV. 14'6", FIRE |

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
MILLSTONE 2

| FRC ITEM NO. | COMPONENT | MANUFACTURER | MODEL NUMBER | LOCATION |
|---|---|---|---|---|
| 50 | PRESSURE TRANSMITTER | GENERAL ELECTRIC | MAC551 | AUXILIARY BUILDING, ELEV. 45'6", FI |
| 51 | PRESSURE TRANSMITTER | GENERAL ELECTRIC | MAC551 | AUXILIARY BUILDING, ELEV. 25'6", FI |
| 52 | PRESSURE TRANSMITTER | FISCHER AND PORTER | 50EP1042BCSA | CONTAINMENT, ELEV. 3'6", FIRE ZONE |
| 53 | FLOW TRANSMITTER | GENERAL ELECTRIC | 555 | AUXILIARY BUILDING, ELEV. 45'6", FI |
| 54 | D/P TRANSMITTER | FOXBORO | E13DH | CONTAINMENT, ELEV. 5'0" |
| 55 | D/P TRANSMITTER | FOXBORO | NE13DH | ZONE A-51 |
| 56 | D/P TRANSMITTER | FOXBORO | E13DM | CONTAINMENT, ELEV. 16'0" |
| 57 | LEVEL TRANSMITTER | GEMS | XM548532841500 | CONTAINMENT, ELEV. 22'6", 15'6" |
| 58 | LEVEL TRANSMITTER | GENERAL ELECTRIC | 551 | TURBINE BUILDING, ELEV. 14'6", FIRE |
| 59 | LEVEL TRANSMITTER | GENERAL ELECTRIC | 555111BCAA3ABA | AUXILIARY BUILDING, ELEV. 25'6", FI |
| 60 | LEVEL TRANSMITTER | FOXBORO | E13DH | CONTAINMENT, ELEV. 3'6", FIRE ZONE |
| 61 | LEVEL TRANSMITTER | FOXBORO | E13DM | AUXILIARY BUILDING, ELEV. 71'0" |
| 62 | LIMIT SWITCH | NAMCO | EA17031100 | AUXILIARY BUILDING, ELEV. 45'6", FI |
| 63 | LIMIT SWITCH | NAMCO | EA180 | CONTAINMENT |
| 64 | LIMIT SWITCH | NAMCO | EA740 | CONTAINMENT |
| 65 | LIMIT SWITCH | NAMCO | EA74020100 | AUXILIARY BUILDING, ELEV. 45'6", LP |
| 66 | LIMIT SWITCH | NAMCO | EA74020100 | AUXILIARY BUILDING, ELEV. 5'0", ZON |
| 67 | LIMIT SWITCH | NAMCO | EA18011302 | AUXILIARY BUILDING PIPING PENETRATI |
| 68 | LIMIT SWITCH | NAMCO | SL3CB2 | AUXILIARY BUILDING, ELEV. 5'0", ZON |
| 69 | ELECTRICAL CABLE | ENDEVCO | 3075M6 | CONTAINMENT, ZONE C-5 |
| 70 | ELECTRICAL CABLE, INSTRUMENT | ROCKBESTOS | XLPE/NEOPRENE | OUTSIDE CONTAINMENT |
| 71 | ELECTRICAL CABLE, INSTRUMENT | ROCKBESTOS | XLPE/NEOPRENE | CONTAINMENT |
| 72 | ELECTRICAL CABLE, COAXIAL | ROCKBESTOS | RSS6104 | CONTAINMENT |
| 73 | ELECTRICAL CABLE, COAXIAL | ROCKBESTOS | RSS6104 | OUTSIDE CONTAINMENT |
| 74 | ELECTRICAL CABLE, POWER | GENERAL CABLE | EPR/HYPALON | OUTSIDE CONTAINMENT |
| 75 | ELECTRICAL CABLE, INSTRUMENT | KERITE | 600V | CONTAINMENT |
| 76 | ELECTRICAL CABLE, INSTRUMENT | KERITE | 600V | OUTSIDE CONTAINMENT |
| 77 | ELECTRICAL CABLE, CONTROL | KERITE | FR/FR | OUTSIDE CONTAINMENT |
| 78 | ELECTRICAL CABLE, CONTROL | KERITE | FR/FR | CONTAINMENT |
| 79 | ELECTRICAL CABLE, POWER | ANACONDA WIRE AND CABLE | EPR/CSPE | CONTAINMENT |
| 80 | ELECTRICAL CABLE, POWER | ANACONDA WIRE AND CABLE | EPR/CSPE | OUTSIDE CONTAINMENT |
| 81 | ELECTRICAL TERMINATION | ROSEMOUNT | 104ADA (TE112MC104AFC1) | CONTAINMENT, ZONE C-5 |
| 82 | TERMINAL BLOCK | WEIDMULLER | TYPE SAK4 | CONTAINMENT |
| 83 | TERMINAL BLOCK | GENERAL ELECTRIC | CR151 | CONTAINMENT, ELEV. 14'6" |
| 84 | TERMINAL BLOCK | GENERAL ELECTRIC | CR151 | ENCLOSURE BUILDING, ELEV. 14'6", ZO |
| 85 | ELECTRICAL PENETRATION | CONAX | 785210000 | CONTAINMENT, ELEV. 14'6" |
| 86 | HYDROGEN RECOMBINER | WESTINGHOUSE | NOT STATED | CONTAINMENT, ELEV. 14'6" (H-29A), E |
| 87 | MOTOR CONTROL CENTER | GENERAL ELECTRIC | ND | AUXILIARY BUILDING, ELEV. 36'6", ZO |
| 88 | ELECTRIC MOTOR | GENERAL ELECTRIC | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 89 | ELECTRIC MOTOR | JOY MANUFACTURING | 382651170 | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 90 | ELECTRIC MOTOR | SIEMANS-ALLIS | ND | ELEV. 45'6", ZONE A2, A4, A5 |
| 91 | ELECTRIC MOTOR | SIEMANS-ALLIS | ND | AUXILIARY BUILDING, ELEV. 45'6", ZO |
| 92 | ELECTRIC MOTOR | JOY MANUFACTURING | 241753500 | CONTAINMENT, ELEV. 14'6" |
| 93 | ELECTRIC MOTOR | WESTINGHOUSE | 7189007 | CONTAINMENT, ELEV. 2'0", 36'0" |
| 94 | ELECTRIC MOTOR | WESTINGHOUSE | TCDP | AUXILIARY BUILDING, ELEV. 25'6", ZO |
| 95 | MOTORIZED VALVE ACTUATOR | LIMITORQUE | ND | CONTAINMENT, ELEV. 19'3" |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ITEM NO. 1
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 1
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR SI617, SI627, SI637, SI647 (SI617, SI627, SI637, SI647)
SERVICE: HPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 9-B
FUNCTION (PLANT ID): OPERATORS FOR SI616, SI626, SI636, SI646 (SI616, SI626, SI636, SI646)
SERVICE: HPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 8-B
FUNCTION (PLANT ID): OPERATORS FOR SI615, SI625, SI635, SI645 (SI615, SI625, SI635, SI645)
SERVICE: LPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 7-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

| | | | | | |
|---|---|---|---|---|---|
| SCEWS No. | 9-B | SCEWS No. | 8-B | SCEWS No. | 7-B |
| TER No. | 42A | TER No. | 41 | TER No. | 40 |
| Date: | 8/21/81 | Date: | 8/21/81 | Date: | 8/21/81 |

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Millstone Unit 2

Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, page 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, PG 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ITEM NO. 2
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 2
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATORS FOR 2-RB37-2A, 2-RB37-2B (HV6108, HV-6106)
SERVICE: REACTOR COOLANT PUMP OIL COOLING WATER DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 12-B
FUNCTION (PLANT ID): OPERATORS FOR 2-RB30-1A, 2-RB30-1B (HV6096, HV6095)
SERVICE: RBCCW TO REACTOR COOLANT PUMPS
LICENSFE SUBMITTAL: SCEW(S): 11-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

| | | | |
|---|---|---|---|
| SCEWS No. | 11-B | SCEWS No. | 12-B |
| TER No. | 42B | TER No. | 42B |
| Date: | 8/21/81 | Date: | 8/21/81 |

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.(A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation which was obtained from Limitorque as applicable to these valves at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, pg 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, pg 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The licensee states that this equipment is not required to function in the event of an

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

NOTES:

accident. This equipment must remain in its safety position. The licensee has not stated that failure of the equipment would cause it to change position. This equipment must be qualified for the accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ITEM NO. 3
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A3 AND A2
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 3
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATORS FOR SI662, SI663 (SI662, SI663)
SERVICE: SHUTDOWN HEAT EXCHANGER TO HPSI SUCTION
LICENSEE SUBMITTAL: SCEW(S): 15-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

SCEWS No. 15-B
TER No. A2E
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, pg. 5g)

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3.

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The licensee states that this equipment is not required to function in the event of an

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

NOTES:

accident. This equipment must remain in its safety position. The licensee has not stated that failure of the equipment would cause it to change position. This equipment must be qualified to the accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ITEM NO. 4
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2 AND A3
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 4
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR SI653, SI654, SI655, SI656 (SI653, SI654, SI655, SI656)
SERVICE: HPSI PUMP DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 13-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

LICENSEE RESPONSE TO NRC SER

SCEWS No. 13-B
TER No. 42C
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, Pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg 5g)

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The licensee states that this equipment is not required to function in the event of an

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

NOTES:

accident. This equipment must remain in its safety position. The licensee has not stated that failure of this equipment would cause it to change position. This equipment must be qualified for the accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ITEM NO. 5
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT, ELEV. 1'6"
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 5
LICENSEE REFERENCE(S): 706
FUNCTION (PLANT ID): OPERATORS FOR SI-651, SI-652 (SI-651, SI-652)
SERVICE: SHUTDOWN COOLING ISOLATION VALVES
LICENSEE SUBMITTAL: SCEW(S): 24-A
FUNCTION (PLANT ID): PRESSURE RELIEF ISOLATION VALVE OPERATORS (RC403, RC405)
SERVICE: PORV BLOCK VALVE
LICENSEE SUBMITTAL: SCEW(S): 1-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable for RC403, RC405

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER

SCEWS No. 24-A
TER No. 22
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.(A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

TER had no concerns.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER (Continued)

SCEWS No. 1-C
TER No. 70D
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, Pg 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ITEM NO. 6
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A-9
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 6
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATOR FOR CH 504 (CH 504)
SERVICE: RADWASTE WATER VALVE TO CHARGING PUMPS HEADER
LICENSEE SUBMITTAL: SCEW(S): 25-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
(III.b Not in Scope)
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | X |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

Notes: 1. Valve is manually controlled and used in transit from hot standby to cold shutdown only.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (~~IIIa~~/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

The licensee has stated that this equipment is required to achieve cold shutdown. Equipment required to achieve cold shutdown only are not in the scope of this review. The licensee has also stated that this valve is "manually controlled". If the licensee is implying that the valve is locked open with power removed, then this equipment item need not be qualified and could be deleted from their master list because it is essentially a mechanical equipment item.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ITEM NO. 7
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A9
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 7
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATOR FOR CH501 (CH 501)
SERVICE: VOLUME CONTROL TANK DISCHARGE VALVE
LICENSEE SUBMITTAL: SCEW(S): 84-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

LICENSEE RESPONSE TO NRC SER

SCEWS No. 84-B
TER No. 703
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

SCEWS 84-B not addressed in SER.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg. 5f

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 8
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A4
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 8
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATORS FOR SI411, SI412 (SI411, SI412)
SERVICE: HPSI PUMP SUCTION
LICENSEE SUBMITTAL: SCEW(S): 16-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, ~~5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c Qualified Life Deficiency)
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | X |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER

SCEWS No. 16-B
TER No. 42F
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES: "X" DENOTES APPROPRIATE NOTES

____ 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s).

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE A, pg. 5g)

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

A. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where Teflon has been used in some cases.

B. The licensee states that this equipment is not required to function in the event of an accident. This equipment must remain in its safety position. The licensee has not stated that failure of the equipment would cause it to change position. This equipment must be qualified for the accident conditions.

C. The licensee has cited a Telex from Limitorque which, though the document is not available for review, has been assumed to establish similarity between the installed motor on the MSIV and the specimen tested in PGR # 1064. No similarity was established to PGR # 1620.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ITEM NO. 9
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A18 AND A17
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 9
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATOR FOR CS 4.1A (HV3021)
SERVICE: CONTAINMENT SPRAY STOP VALVE
LICENSEE SUBMITTAL: SCEW(S): 89-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
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| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER

SCEWS No. 89-B
TER No. 70C
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.
FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, PG. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, PG. 5g)

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ITEM NO. 10
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 10
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR CH-429 (HV2524)
SERVICE: CHARGING PUMP DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 10-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10.

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

SCEWS No. 10-B
TER No. 42B
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation which was obtained from Limitorque as applicable to these valves at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, Pg 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ITEM NO. 11
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 11
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATORS FOR CS 16.1A, 16.1B (HV3008, HV3009)
SERVICE: CONTAINMENT SUMP RECIRCULATION
LICENSEE SUBMITTAL: SCEW(S): 83-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QV, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
[II.a Qualification Not Established]
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

SCEWS No. 83-B
TER No. 70A
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, pg. 5g)

X 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ITEM NO. 12
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM, ELEV. 38'6", ZONE A50
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR MS-65A (HV4218)
SERVICE: STEAM GENERATOR NO. 1 MAIN STEAM ISOLATION BYPASS
LICENSEE SUBMITTAL: SCEW(S): 17-B
FUNCTION (PLANT ID): OPERATOR FOR MS-201 (HV4191)
SERVICE: STEAM GENERATOR NO. 1 TO AUXILIARY FEEDWATER TURBINE BLDG.
LICENSEE SUBMITTAL: SCEW(S): 18-B
FUNCTION (PLANT ID): OPERATOR FOR MS-65B (HV4222)
SERVICE: STEAM GENERATOR NO. 2 MAIN STEAM ISOLATION BYPASS
LICENSEE SUBMITTAL: SCEW(S): 19-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | X |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

LICENSEE RESPONSE TO NRC SER

| | | | | | |
|---|---|---|---|---|---|
| SCEWS No. | 19-B | SCEWS No. | 18-B | SCEWS No. | 17-B |
| TER No. | 42G | TER No. | 42G | TER No. | 42G |
| Date: | 8/21/81 | Date: | 8/21/81 | Date: | 8/21/81 |

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Millstone Unit 2

Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation which was obtained from Limitorque as applicable to these valves at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, pg. 5g)

___ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

___ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

___ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

D. The peak temperature is of such a short duration that the surface temperature of the MUA would not rise significantly. This is based on transient heat transfer analysis performed on this type of equipment for similar profiles. Combining this with the fact that there is no radiation dose on the equipment leaves thermal aging and qualified life as the only deficiency.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

EQUIPMENT ITEM NO. 13
MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM, ELEV. 38'6", ZONE A51
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 13
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR MS-202 (HV4189)
SERVICE: STEAM GENERATOR NO. 2 TO AUXILIARY FEEDWATER TURBINE
LICENSEE SUBMITTAL: SCEW(S): 20-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | X |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

LICENSEE RESPONSE TO NRC SER

SCEWS No. 20-B
TER No. 42G
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation which was obtained from Limitorque as applicable to these valves at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, Pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

D. The peak temperature is of such a short duration that the surface temperature of the MVA would not rise significantly. This is based on transient heat transfer analyses performed on this type of equipment for similar profiles. Combining this with the fact that there is no radiation dose on the equipment leaves thermal aging and qualified life as the only deficiency.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 14
MOTORIZED VALVE ACTUATOR LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", ZONE T10
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 14
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR FW-43A, FW-43B (HV5276)
SERVICE: AUXILIARY FEEDWATER ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 14-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | X |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

SCEWS No. 14-B
TER No. 42D
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A, Pg. 5g)

X 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).

X 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. The Licensee has not identified the type of current used in the motorized valve actuator.

X 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).

X 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (NOTE B, Pg. 5g)

____ 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.

____ 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of _____ is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.

____ 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

A. The licensee has not established similarity between the installed equipment AND THE EQUIPMENT tested in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently identified the installed equipment (see page 5f) enough to allow similarity to be established by another means. The licensee has not provided the model numbers of the motorized valve actuators installed in Millstone Unit 2. It is likely that they are SMB model (various sizes). The licensee has provided serial numbers for the actuator, but has not specified the motor serial numbers or the manufacturer's order numbers. In addition to the items identified on page 5f, the licensee should also identify the motor lead insulation material. The licensee should be aware that Teflon has been used in this application in some cases.

B. The licensee has claimed a qualified life of 40 years based on the testing performed in the referenced report(s). No supporting documentation has been provided by the licensee. There was no basis stated in the report(s) for the thermal aging times and temperatures chosen. It is also noted that the thermal aging performed simulates only a fraction of the qualified life claimed by the licensee. The licensee should analyze this equipment item based on an acceptable technique. Particular attention should be paid to the motor lead insulation where, as stated in note A, Teflon has been used in some cases.

C. The required operating time has not been explicitly stated. A specific time value should be stated based on a conservative estimate of the

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

of the maximum time frame during which this equipment item may be required to perform a safety function. This information is usually based on the licensee's FSAR, Technical Specifications or Emergency Operating Procedures. Without this information, it is impossible to determine if the test conditions adequately envelop the postulated accident conditions.

D. However, due to the fact that there is no radiation specified for either the normal or accident conditions, the only deficiency that this equipment item has is qualified life. The temperature excursion should pose no problem for this equipment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ITEM NO. 15
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A-50
ASCO MODEL NP8320A183E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 15
LICENSEE REFERENCE(S): 2850, 649
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-5419, 5421)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 46-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-5420, 5422)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 46-BA

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines ___; NUREG-0588, Cat. I X; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION<br>Equipment Type | Solenoid Valve | Solenoid Valve | |
| Manufacturer's Name (5.2.2/-/-) | ASCO | Automatic Switch Company | |
| Model Number (5.2.2/-/-) | see pg 1a. | HVA-206-381-6F<br>NP8344A71E | |
| Serial Number | | XFT831654V<br>HVA-206-308-3RF | |
| Features/Mounting (5.2.6/-/-) | | NP8320A184E<br>NP831665E<br>HV-202-300-2RF | |
| Connections/Interfaces (5.2.6/-/-) | | NP8321A5E<br>NP8323A39E | |
| Location/Elevation | see pg. 1a | | |
| Equipment ID No. | | | |
| QUALIFICATION REPORT (8.0/5.0/5.0)<br>Report ID Number | PGR 2850<br>AQS21678TR rev. B | AQS21678/TR (Rev. A) | |
| Report Date | | [redacted]<br>July, 1979 | |
| Issued by | | Isomedix Inc. | |
| Prepared for | | ASCO | |
| Referenced Reports | | | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | | Type Test | |
| QUALIFICATION TEST PROGRAM<br>Functional Test Description (5.2.5/2.2.9/2.2.9) | | Coil excitation Voltage<br>Seat leakages, noise,<br>IR test. | |
| Operating Conditions (-/2.2.10/2.2.10)<br>Load/Cycles/Voltage/<br>Current/Freq. | | Samples energized and deenergized at high and low pressure | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Operate at -15% & + 10% (Short Period) Rate VAC, 90-140 VDC | |
| Accuracy (5.2.5/-/-) | | Max & Min. D/P. | |
| Number of Specimens | | IR Coil > 1.0 Megohn at 500 VDC. C-L < 0.5 MA @ 2x rated Voltage + 1000 V for | |
| Test Instruments Calibrated | | 1 min. | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | pilot Solenoid valves | | |
| Test Duration (5.2.1/-/-) | | | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | | | |
| Required Function Time | see pg 1a. | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Baseline functional tests Thermal Aging Radiation Aging Operational Aging | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | Seismic/Vibration DBE radiation exposure STM + CHSP Exposure | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | | 268 deg. F/288 hr. 4.4 yr @ 140 deg. F | |
| Material Aging Evaluation (7.0/-/-) | | | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | | Solenoid Coils & Elastomeric parts | |
| Radiation Aging, Type | | GAMMA | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | | $50 \times 10^6$ rd | |
| | | 1.0 Mrd/hr. | |
| Radiation Aging, Dose Rate | | Test | |
| Radiation Aging, Method | | | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | | | |
| Operational Aging (-/4.2/-) | | 40,000 cycles @ MOPD | |
| Other Age Conditioning (-/4.2/-) | | | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 4.4 yrs | 4.4 yr./ND | |
| Normal Ambient Temperature | | | |
| Normal Ambient Radiation | | | |
| Normal Ambient Humidity | | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | Licensee maintenance performed every 3yrs. | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | | |
| Margin (General) (6.0/3.0/3.0) | | | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-) | | | |
| 1. Temperature (+15°F) | | | |
| 2. Pressure (+10%, 10 psig max) | | | |
| 3. Radiation (not required) | | | |
| 4. Time (+10%, +1 hour + function time minimum) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | | LOCA | |
| Radiation Type | | GAMMA | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.5 \times 10^8$ rd | 150 Mrd | |
| Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-) | | <1 Mrd/hr. | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | -- | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | | -- | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $1.5 \times 10^8$ rd. (TID) | 200 Mrd | |
| Plateout Dose Considered (-/1.48/1.48) | | -- | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | -- | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | | 28.8 deg. F/min/9.1 psig/min | |
| Peak: °F/psig/RH/Time | | 346/110/100/3 HR | |
| | | 320/75/100/3 HR | |
| Decrease To: °F/psig/RH/Time | | 250/15/100/85 HR | |
| | | 200/10/100/26 days | |
| Decrease To: °F/psig/RH/Time | | | |
| Decrease To: °F/psig/RH/Time | | | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | | -- | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | | TEST | |
| | | $H_3BO_3$ (3000ppm boron) | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 ppm boron | 0.064m Sodium Thiosulfate NaOH ph= 10.0 | |
| Spray Density (gpm/ft$^2$) | | 0.306 | |
| Spray Duration | | 30 days | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | | | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | | | |
| Time to Submergence | | | |
| Dust Environment (-/2.2.11/2.2.11) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

NOTES:

Results of this test show that low Insulation resistance values were demonstrated at the end of the LOCA test for the coils. It was concluded that the solenoid enclosure interface degraded to the point where spray solution entered the enclosure, degrading the coil insulation, resulting in current leakage to ground. The test report also indicates that even though the coil enclosure became filled with spray solution, the valves functioned for the duration of the LOCA test. It is recommended that the licensee provide a suitable seal for the cable entry to the solenoid enclosure.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ITEM NO. 16
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 8'6"
ASCO MODEL NP8320A185V
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 16
LICENSEE REFERENCE(S): 2850, 649
FUNCTION (PLANT ID): PILOT VALVES FOR CH-518 AND CH-519 (HY-518, HY-519)
SERVICE: CHARGING LINE DISTRIBUTION VALVES
LICENSEE SUBMITTAL: SCEW(S): 14-A
FUNCTION (PLANT ID): PILOT VALVES FOR CH-515, CH-516 (HV-515, HV-516)
SERVICE: LETDOWN SYSTEM CONTAINMENT ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 16-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ITEM NO. 17
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO MODEL NP8320A177E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 17
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-306)
SERVICE: CONTROL SHUTDOWN COOLING FLOW BYPASS
LICENSEE SUBMITTAL: SCEW(S): 43-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-657)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 47-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-2525)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 52-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY4250, 4251)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 58-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-7690)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 68-BA
FUNCTION (PLANT ID): PILOT VALVE (HY-7312)
SERVICE: NITROGEN STOP VALVE TO SAFETY INJECTION TANKS
LICENSEE SUBMITTAL: SCEW(S): 108-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (U), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | ____ |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A-18
ASCO MODEL NP8321A5E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 18
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-7311)
SERVICE: PRIMARY MAKEUP WATER TO QUENCH TANK
LICENSEE SUBMITTAL: SCEW(S): 95-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-9126)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 68-B
FUNCTION (PLANT ID): PILOT VALVE (HY-9016)
SERVICE: PRIMARY DRAIN TANK DISCHARGE ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 100-B
FUNCTION (PLANT ID): PILOT VALVE (HY-505)
SERVICE: RCP BLEED OFF ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 102-B
FUNCTION (PLANT ID): PILOT VALVE (HY-9150)
SERVICE: CONTAINMENT SUMP ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 110-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ITEM NO. 19
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6" AND 14'6", ZONE A51
ASCO MODEL WPHTX8320A184
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 19
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-4209)
SERVICE: MAIN STEAM HEADER LOW POINT DRAINS
LICENSEE SUBMITTAL: SCEW(S): 66-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) QT, RT, (P) (H) CS, (A) S, (R), M, I, (QM) RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "December 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (QI, QM, T, P, H, R, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** SOLENOID OPERATED VALVE
PILOT OPERATOR FOR MAIN STEAM HEADER LOW POINT DRAINS
HY-4209, 4193

**MANUFACTURER:** Automatic Switch Company (ASCO)

**QUALIFICATION DISCREPANCY:** These components are discrepant because of the lack of documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components are required to operate to isolate the main steam header low point drains on a main steam isolation signal. The failure of these components to perform this function is bounded by the existing accident analysis. Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ITEM NO. 20
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO MODEL NP8321A6E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 20
LICENSEE REFERENCE(S): 285C
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6050)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 56-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ITEM NO. 21
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A50
ASCO MODEL HPX8211B54SW
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 21
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (VARIOUS)
SERVICE: MAIN STEAM ISOLATION TRIP VALVE PILOT OPERATOR
LICENSEE SUBMITTAL: SCEW(S): 40-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), QT, RT, (P) H, CS, (A) S, (R), M, I, (QM), RPN, EXN, SEN, (QI), (RPS) None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~3a~~, ~~4a~~, ~~4c~~, ~~4d~~, ~~4e~~, ~~4f~~ |
| Equipment Environmental Qualification Review | ~~5a~~, ~~5b~~, ~~5c~~, ~~5d~~, ~~5e~~, ~~5f~~, ~~5g~~, ~~5h~~, ~~5i~~, ~~5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a~~, ~~6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a~~, ~~7b~~, ~~7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "December, 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (RPS, T, P, R, QM, QI, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** Solenoid Operated Valves
Main Steam Isolation Valve Pilot Operators

**MANUFACTURER:** Automatic Switch Company (ASCO)

**QUALIFICATION DISCREPANCY:** These components are discrepant because they lack documented qualification test data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These equipments function as pilot operating devices for the main steam isolation valves, (MSIV). The engineered safety features actuation response time for main steam isolation is 6.9 seconds as specified in the technical specifications.

The redundant solenoid valves on each MISV which isolate the air supply to the MSIV de-energize on an isolation signal to accomplish this function within the first second of the accident.

The solenoid valves required to operate to vent the MSIV operator must energize to vent.

Reasonable assurance is provided for performance of this function as described by the existence of the following conditions:

Each MSIV is provided with two separate and redundant vent SOV's. These SOV's will open (energize) within the first second of the accident initiation. The coils of these components are rated for continuous energization with maximum fluid temperatures existing within the SOV. These components are de-energized and at ambient temperature at the onset of the accident. Given the mass of the components, their initial de-energized state and the high temperature rating of the coil assemblies, it is extremely unlikely that these components would experience an environment which exceeds their rating and results in their failure prior to their performing their function within the required time.

The MISV's are reverse acting check valves. Hence when a MSIV closure is initiated differential pressure across the MSIV assists in closure of the valve, therefore, reducing the actual closure time to considerably less than the 6.9 seconds identified as required by the technical specifications.

This matter was also discussed in the October 5, 1979 letter from W. G. Counsil to H. R. Denton. To date the staff has not responded negatively to this letter, thereby inferring concurrence with the conclusions presented therein.

The manufacturer is currently analyzing these components with respect to the accident environment experienced, to establish an operable life for these components under accident conditions.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

LICENSEE RESPONSE TO NRC SER

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 22
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A-18
ASCO MODEL NP831655E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 22
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6073, 6077)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLED INLET
LICENSEE SUBMITTAL: SCEW(S): 96-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6084)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 97-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6092)
SERVICE: SAMPLE & GAS EFFLUENT FILTER STOP VALVE
LICENSEE SUBMITTAL: SCEW(S): 98-B
FUNCTION (PLANT ID): PILOT VALVE (HY-7083)
SERVICE: CONTAINMENT INSTRUMENT AIR BLOCK VALVE
LICENSEE SUBMITTAL: SCEW(S): 99-B
FUNCTION (PLANT ID): PILOT VALVE (HY-6080, 6088)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 106-B
FUNCTION (PLANT ID): PILOT VALVE (HY-6072, 6075)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER INLET
LICENSEE SUBMITTAL: SCEW(S): 107-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a-1, 1a-2 |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 22 (CONTINUED)
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HT-4246, 4248)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 50-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, 3c, 3d |
| System Consideration Review | 4a, 4b, 4c, 4d, 4e, 4f |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j |
| Installed TMI Lessons Learned Implementation Equipment Summary | 6a, 6b |
| Maintenance and Replacement Schedule Summary | 7a, 7b, 7c |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualificat on by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | ____ |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ITEM NO. 23
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6"
ASCO MODEL NP831655E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 23
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-659, HY-660)
SERVICE: SAFETY INJECTION PUMP DISCHARGE BYPASS HEADER
LICENSEE SUBMITTAL: SCEW(S): 94-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 24
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A51
ASCO MODEL HT8211D4
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 24
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (VARIOUS)
SERVICE: MAIN STEAM ISOLATION TRIP VALVE PLIOT OPERATOR
LICENSEE SUBMITTAL: SCEW(S): 40-BA

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) QT, RT, (P) H, CS, (A) S, (R), M, I, (QM) RPN, EXN, SEN, (QI) (RPS) None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "December, 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (RPS, T, P, R, QM,QI, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** Solenoid Operated Valves
Main Steam Isolation Valve Pilot Operators

**MANUFACTURER:** Automatic Switch Company (ASCO)

**QUALIFICATION DISCREPANCY:** These components are discrepant because they lack documented qualification test data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These equipments function as pilot operating devices for the main steam isolation valves, (MSIV). The engineered safety features actuation response time for main steam isolation is 6.9 seconds as specified in the technical specifications.

The redundant solenoid valves on each MISV which isolate the air supply to the MSIV de-energize on an isolation signal to accomplish this function within the first second of the accident.

The solenoid valves required to operate to vent the MSIV operator must energize to vent.

Reasonable assurance is provided for performance of this function as described by the existence of the following conditions:

Each MSIV is provided with two separate and redundant vent SOV's. These SOV's will open (energize) within the first second of the accident initiation. The coils of these components are rated for continuous energization with maximum fluid temperatures existing within the SOV. These components are de-energized and at ambient temperature at the onset of the accident. Given the mass of the components, their initial de-energized state and the high temperature rating of the coil assemblies, it is extremely unlikely that these components would experience an environment which exceeds their rating and results in their failure prior to their performing their function within the required time.

The MISV's are reverse acting check valves. Hence when a MSIV closure is initiated differential pressure across the MSIV assists in closure of the valve, therefore, reducing the actual closure time to considerably less than the 6.9 seconds identified as required by the technical specifications.

This matter was also discussed in the October 5, 1979 letter from W. G. Counsil to H. R. Denton. To date the staff has not responded negatively to this letter, thereby inferring concurrence with the conclusions presented therein.

The manufacturer is currently analyzing these components with respect to the accident environment experienced, to establish an operable life for these components under accident conditions.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

LICENSEE RESPONSE TO NRC SER

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ITEM NO. 25
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 25
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6731)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 53-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee ([redacted]/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ITEM NO. 26
SOLENOID VALVE LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", ZONE T10
ASCO MODEL HT834481
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 26
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6438, 6439)
SERVICE: TBCCW HEAT INLET ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 72-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) QT, RT, (P) (H) CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b~~, ~~3c~~, ~~3d~~ |
| System Consideration Review | ~~4a~~, ~~4b~~, ~~4c~~, ~~4d~~, ~~4e~~, ~~4f~~ |
| Equipment Environmental Qualification Review | ~~5a~~, ~~5b~~, ~~5c~~, ~~5d~~, ~~5e~~, ~~5f~~, ~~5g~~, ~~5h~~, ~~5i~~, ~~5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a~~, ~~6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a~~, ~~7b~~, ~~7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "December, 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (RPN, T, P, H, R, A, QI)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** SOLENOID OPERATED VALVES
Pilot Operators for Valve No. (HV-6438, 6439)
#1, 2 & 3 turbine building closed cooling water heat exchanger inlet isolation valves

**MANUFACTURER:** Automatic Switch Company (ASCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components function as pilot operating mechanisms for TBCCW valves outside containment. These valves are required to close on a SIAS. The catalog specifications for this equipment envelop the environmental parameters experienced by these components during a MSLB, therefore, the environment will not impair these components in performance of their safety function. The manufacturer is currently reviewing the subject components and the respective environmental profiles in order to provide documented assurance of component suitability to perform its safety function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ITEM NO. 27
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
ASCO MODEL NP8344 B58V
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 27
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVES FOR EB-91, EB-100 (HV-8380, HV-8378)
SERVICE: HYDROGEN PURGE VALVES
LICENSEE SUBMITTAL: SCEW(S): 21-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ITEM NO. 28
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 8'6"
ASCO MODEL 2003816RF
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 28
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVE FOR CH-517 (HY-517)
SERVICE: AUXILIARY SPRAY
LICENSEE SUBMITTAL: SCEW(S): 15-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See equipment item no. 15 for evaluation. The model on the SCEW sheet is not listed as one of the models qualified

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ITEM NO. 29
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A50 AND A51
ASCO MODEL NP2063816F
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 29
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT VALVE (PV 4223, PV 4224)
SERVICE: CONTINUOUS #11 #2 ATMOSPHERIC DUMPS
LICENSEE SUBMITTAL: SCEW(S): 35-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | ____ |

See equipment item no 15 for evaluation

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ITEM NO. 30
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
ASCO MODEL 2063813RVU
REQUIRED OPERATING TIME: 5 SECONDS
TER CHECKSHEET NO. 30
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVES FOR EB-88, EB-89 (HV-8150, HV-8151)
SERVICE: CONTAINMENT RADIATION MONITOR ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 17-A
FUNCTION (PLANT ID): PILOT VALVES FOR LRR 43.1, GR-11.1, CH-506, SSP-16.1 (HV-9230, HV-9125, CH 506, HV-9151)
SERVICE: CONTAINMENT ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 19-A
FUNCTION (PLANT ID): PILOT VALVES FOR RC-001, RC-002, RC-003 (HV-1064, HV-1062, HV-1060)
SERVICE: REACTOR COOLANT SAMPLE VALVES
LICENSEE SUBMITTAL: SCEW(S): 20-A
FUNCTION (PLANT ID): PILOT VALVES FOR SI618, SI628, SI638, SI648(HY618, 628, 638, 648)
SERVICE: SAFETY INJECTION TANK TEST AND FILL VALVES
LICENSEE SUBMITTAL: SCEW(S): 25-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

See review of equipment item no. 15 for evaluation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ITEM NO. 31
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
VALCOR MODEL V52660423A V52660433A
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 31
LICENSEE REFERENCE(S): 1834
FUNCTION (PLANT ID): REACTOR HEAD AND PRESSURIZER VENTING (RC-442, 414, 415, 416, 417, 423, 424, 425)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 34A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable new item)

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | X |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines ___; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION | | | |
| Equipment Type | Solenoid Valve | Solenoid Valve | |
| Manufacturer's Name (5.2.2/-/-) | Valcor Engineering | Valcor Engineering | |
| Model Number (5.2.2/-/-) | V526 | V52600-5291-2 | |
| Serial Number | | | |
| Features/Mounting (5.2.6/-/-) | | | |
| Connections/Interfaces (5.2.6/-/-) | | | |
| Location/Elevation | Containment | | |
| Equipment ID No. | see pg 1a | | |
| QUALIFICATION REPORT (8.0/5.0/5.0) | | | |
| Report ID Number | PGR#1834 | QR-52600-5940-2 | |
| Report Date | QR-52600-5940-2 | 05-July-1979 | |
| Issued by | | Valcor Engineering Corp. | |
| Prepared for | | Isomedix Inc. | |
| Referenced Reports | | IFR-V877-01 | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | | Type Test | |
| QUALIFICATION TEST PROGRAM | | | |
| Functional Test Description (5.2.5/2.2.9/2.2.9) | | Insulation Resistance Tests | |
| Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq. | | 108 VAC<br>44 psig $N_2$ | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Pass Functional Tests, Demonstrate Satisfactory Operability | |
| Accuracy (5.2.5/-/-) | | ND | |
| Number of Specimens | | 1 | |
| Test Instruments Calibrated | | Yes | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Rx and pressurizer vent | | |
| Test Duration (5.2.1/-/-) | | 31 Days | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | | | |
| Required Function Time | continuous | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | TA/OPER/RAD/SEIS/STM+CHSP | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | | 318 deg.F, 172 Hr. To Simulate 40 Yrs. @ 120 deg.F | X note 2 |
| Material Aging Evaluation (7.0/-/-) | | MR52600-515-2 Additional 442 Hr.@318°F to age polyimide to 40 Yr. | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | | Coil Materials | |
| Radiation Aging, Type | | GAMMA | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | see accident dose pg. 5d | $50 \times 10^6$ | |
| Radiation Aging, Dose Rate | | 0.75 Mrd/h | |
| Radiation Aging, Method | | Test | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | | | |
| Operational Aging (-/4.2/-) | | 7500 cycles<br>44psig $N_2$ | |
| Other Age Conditioning (-/4.2/-) | | Seismic Simulation | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 40yrs. | 40 Yr./40 Yr. | X note 2 |
| Normal Ambient Temperature<br>Normal Ambient Radiation<br>Normal Ambient Humidity | | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | | |
| Margin (General) (6.0/3.0/3.0) | | | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | | | |
| Radiation Type | | GAMMA | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.5 \times 10^8$ rd. | $150 \times 10^6$ | |
| Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-) | | $0.75 \times 10^6$, Test | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | | | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $1.5 \times 10^8$ rd (TID) | $200 \times 10^6$ rad | |
| Plateout Dose Considered (-/1.48/1.48) | | NA | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | NA | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | | Not Stated But Within 3 - 5 Min. | |
| Peak: °F/psig/RH/Time | | 346/113/100/3h | |
| Decrease To: °F/psig/RH/Time | | 335/113/100/3h | |
| Decrease To: °F/psig/RH/Time | | 315/69/100/4h | |
| Decrease To: °F/psig/RH/Time | | 272/28/100/4h | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | | 245/13/100/27.5d | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | | Test (Simultaneous) | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 ppm boron | 2200 ppm Boron $H_3BO_3$ 0.064m $Na_2S_2O_3$ NaOH, ph=10.5 | |
| Spray Density ($gpm/ft^2$) | | 0.15 $gpm/ft^2$ | |
| Spray Duration | | 44,640 min. | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | | | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | | | |
| Time to Submergence | | | |
| Dust Environment (-/2.2.11/2.2.11) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

NOTES:

1. It was determined by analysis that polyimide would require additional thermal aging of 442 hr. @ 318°F to simulate 40 yrs @ 120°F. All other coil materials were subsequently overaged during the additional thermal aging.

2. The Licensee should establish a qualified life estimate for this equipment if it is used in a normally energized application in which coil heat rise would be a problem.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ITEM NO. 32
AMPLIFIER LOCATED IN THE CONTAINMENT, ZONE C-5
UNHOLTZ-DICKIE MODEL 22CAZTR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 32
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS-200, 201, 402, 404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 19-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable new item)

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | 6a, ~~6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "October, 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

LICENSEE RESPONSE TO NRC SER

Notes: a. This equipment is purchased on a risk release basis pending completion of vendor qualification testing and NUSCO review and acceptance of the final test reports. The target date for receipt of the final test report is 10-81. The qualification documentation references will be identified at that time.
The qualified life for this equipment will be determined in accordance with IEEE 323-1974 guidelines.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2), in accordance with criteria established by the NRC (see Section 2 of this report) in a manner identical to the evaluation of all other safety-related electrical equipment. The scope of this review is limited to TMI Action Plan equipment associated with specific sections of NUREG-0737 which have an installation implementation date of January 1, 1981 (sections are identified below). Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

This plant is a PWR X, BWR ____.
The NSSS Vendor is Westinghouse (W) ____, Babcox & Wilcox (B&W) ____,
Combustion Engineering (CE) X, General Electric (GE) ____.

With respect to this equipment item, it is noted (applicable section checked):

___ The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.

___ The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]

___ The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.

___ The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.

___ The Licensee has requested extensions of implementation dates.

___ The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):

___ II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment

X II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ITEM NO. 33
ACCELEROMETER LOCATED IN THE CONTAINMENT, ZONE C-5
ENDEVCO MODEL 2273AM20
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 33
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS200, 201, 402, 404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 17-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable new item)

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | 6a, ~~6b.~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "October, 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

Notes: a. This equipment is purchased on a risk release basis pending completion of vendor qualification testing and NUSCO review and acceptance of the final test reports. The target date for receipt of the final test report is 10-81. The qualification documentation references will be identified at that time.
The qualified life for this equipment will be determined in accordance with IEEE 323-1974 guidelines.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

## INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2), in accordance with criteria established by the NRC (see Section 2 of this report) in a manner identical to the evaluation of all other safety-related electrical equipment. The scope of this review is limited to TMI Action Plan equipment associated with specific sections of NUREG-0737 which have an installation implementation date of January 1, 1981 (sections are identified below). Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

This plant is a PWR X, BWR ____.
The NSSS Vendor is Westinghouse (W) ____, Babcox & Wilcox (B&W) ____,
Combustion Engineering (CE) X, General Electric (GE) ____.

With respect to this equipment item, it is noted (applicable section checked):

___ The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.

___ The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]

___ The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.

___ The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.

___ The Licensee has requested extensions of implementation dates.

___ The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):

___ II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment

X II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ITEM NO. 34
RADIATION DETECTOR LOCATED IN THE CONTAINMENT, ELEV. 18'6"
GENERAL ATOMIC MODEL RD23
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 34
LICENSEE REFERENCE(S): 3528
FUNCTION (PLANT ID): ACCIDENT/POST ACCIDENT RADIATION MONITORING (RE 8240, 8241)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 15-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable new item)

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| (II.a) Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | X |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

LICENSEE RESPONSE TO NRC SER

**Summary of new information on SCEW sheet.**

Qualification information contained in General Atomic Test Report E-254-960, now included, which completes qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines ___; NUREG-0588, Cat. I X; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION<br>Equipment Type | Radiation Monitor | HIGH RANGE RADIATION MONITOR | |
| Manufacturer's Name (5.2.2/-/-) | General Atomic | GENERAL ATOMIC | |
| Model Number (5.2.2/-/-) | RD-23 | RD-23 | |
| Serial Number | | Y-501; Y-1894-A | see pgs 5f, 5g, 5k |
| Features/Mounting (5.2.6/-/-) | | REUTER STOKES RS-C3-1006-201 DETECTOR ASSEMBLY | X see note 1 |
| Connections/Interfaces (5.2.6/-/-) | | ROCKBESTOS COAX RAYCHEM WCSF (splice sleeves) | |
| Location/Elevation | Containment | | |
| Equipment ID No. | RE-8240 -8241 | | |
| QUALIFICATION REPORT (8.0/5.0/5.0)<br>Report ID Number | PGR#3528 GA E-254-960 | E-254-960 | |
| Report Date | | DECEMBER 15, 1980 | |
| Issued by | | GENERAL ATOMIC | |
| Prepared for | | GENERAL ATOMIC | |
| Referenced Reports | | | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | | | |
| QUALIFICATION TEST PROGRAM<br>Functional Test Description (5.2.5/2.2.9/2.2.9) | | leakage current check | |
| Operating Conditions (-/2.2.10/2.2.10)<br>Load/Cycles/Voltage/ Current/Freq. | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | | |
| Accuracy (5.2.5/-/-) | | | |
| Number of Specimens | | 2 | |
| Test Instruments Calibrated | | | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Post Accident Radiation Monitoring | | |
| Test Duration (5.2.1/-/-) | | | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | | | |
| Required Function Time | continuous | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | LOCA; SEISMIC | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | | Not performed | see pgs. 5f, 5g, 5h X |
| Material Aging Evaluation (7.0/-/-) | | General Atomic E-115-699 | note 3 |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | | | |
| Radiation Aging, Type | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | | Not Performed | |
| Radiation Aging, Dose Rate | | | |
| Radiation Aging, Method | | | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | | | |
| Operational Aging (-/4.2/-) | | | |
| Other Age Conditioning (-/4.2/-) | | Age conditioning margin test on interconnected assemblies | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | | 3days, 3cycle 60°C, 80-90%rh | |
| Normal Ambient Temperature | | | |
| Normal Ambient Radiation | | | |
| Normal Ambient Humidity | | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | ANALYSIS OF TRANSIENT EFFECTS DURING LOCA DUE TO PIEZOELECTRIC EFFECTS | |
| Margin (General) (6.0/3.0/3.0) | | ANALYSIS OF INDUCED GAMMA HEATING | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-) | | | |
| 1. Temperature (+15°F) | | | |
| 2. Pressure (+10%, 10 psig max) | | | |
| 3. Radiation (not required) | | | |
| 4. Time (+10%, +1 hour + function time minimum) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | | | |
| Radiation Type | | not performed | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.5 \times 10^8$ rd. | | |
| Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-) | | | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | | | see pgs. 5f, 5g, 5h |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $1.5 \times 10^8$ rd. | not performed | X note 2 |
| Plateout Dose Considered (-/1.48/1.48) | | | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | see Millstone cont. Profile (App. A) | 70°F, 1.5 psi/sec. | |
| Peak: °F/psig/RH/Time | | 400/57/100/100/10 min. | |
| Decrease To: °F/psig/RH/Time | | 400 to 175/57 to 0/100/10m to 2.4 hours | |
| Decrease To: °F/psig/RH/Time | | 175 to 411/0 to 53/100/8 sec. | see page 5f |
| Decrease To: °F/psig/RH/Time | | 340/57/100/10 min | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | | 330/57/100/10 to 30 min<br>335/57/100/30m to 1 hr.<br>260/40/100/1 h to 4 hr<br>205/46/100/4 Days<br>150/4.5-10/100/4 To 18 Days | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | | Test | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 ppm boron | 0.28 M $H_3BO_3$<br>0.064 M $Na_2S_2O_3$ | |
| Spray Density (gpm/ft$^2$) | | 0.15 gpm/ft$^2$ | |
| Spray Duration | not stated | Continuous after 10 min. | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | | NA | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | | NA | |
| Time to Submergence | | NA | |
| Dust Environment (-/2.2.11/2.2.11) | | NA | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

test

The Licensee has presented information which shows that the RD-23 radiation detector is qualified for Millstone environmental parameters. However the testing showed deficiencies with the original cable and connections interfacing with this detector. These original cable and connections may be identical to those used at Millstone (currently installed). It should be noted that the testing program identified several modifications of interfaces to obtain a satisfactory connector. However, the Coaxial Cable has not yet been qualified (see review of equipment item 9(1)). The test report E-2948-7 stated:

"Although the coaxial cable was not part of the specimen per se, that is, it was not being qualified, the connector/cable interface was. Therefore, the cable difficulties shall be described also.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

Cable difficulties encountered were outer jacket softening with subsequent shield shorting at mechanical contact points, and outer jacket bubbling with subsequent splitting. These two problems were apparently eliminated with the addition of Raychem WCSF shrink tube at areas of coaxial cable stress points and over the cable terminating connector thus effectively sealing the cable end from the environment. Although the cable was previously considered "qualified" for LOCA applications, these evidences exist which imply careful lead preparation upon installation is necessary for this probe/electronics system.

A connector corrosion problem was also corrected with the addition of the Raychem sleeve buildup over the connector.

The final configuration was necessary only for the longer duration test (two weeks), Number 3. The two tests prior to that time did not utilize the Raychem configuration, however, they did employ a sheet metal cover over the connector area (box-shaped) below the probe tip; i.e., the connectors were enclosed with wires exiting the bottom. In test Number 3, the connector area was left open. Four re-tests of test Number 3 were necessary due to the aforementioned problem areas.

Per GAC personnel, the specimen performed acceptably throughout the 19-day Number 3 LOCA test and the shorter Number 1 and 2 tests. Since GAC recorded and retained the specimen output data and have not conveyed the failure criteria to Wyle, they are necessarily charged with the responsibility for reporting what detailed functional results are necessary. //

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

Based on these considerations, the following deficiencies are specifically noted:

(1.) Adequate similarity between the presently installed equipment and the test specimen (connector and cable) interfaces that successfully passed the testing program has not been established.

(2.) The entire detector assembly including interfaces (cable + connector) has not been exposed to radiation testing or analysis.

(3.) Although a satisfactory aging analysis was performed on the detector, no similar analysis was performed on the connector.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ITEM NO. 35
ELECTRICAL CONNECTOR LOCATED IN VARIOUS LOCATIONS INSIDE CONTAINMENT
IDEAL MODEL 30210/30211
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 35
LICENSEE REFERENCE(S): 905
FUNCTION (PLANT ID): SPLICE ASSEMBLIES
SERVICE: VALVE LIMIT SWITCH CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 13-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, ~~5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| (I.a Qualified) | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

NOTES: This Equipment has been previously evaluated on Northeast Utilities submittal for Haddam Neck (TER C5257-460) which stated:



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ITEM NO. 51
ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT (INBOARD PENETRATION AREA)
IDEAL MODEL CAT NO. 30210
REQUIRED OPERATING TIME: VARIOUS
TER CHECKSHEET NO. 51
LICENSEE REFERENCE(S): 905, 718
REFERENCE 25, SECTION 4.3.3.1, FORMER ITEM 50
FUNCTION (PLANT ID): ELECTRICAL CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-10-56 [30]



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

This equipment item was previously evaluated in Reference 25. See page 1A Equipment Item description.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ITEM NO. 36
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMPS FLOW (FT-212)
SERVICE: CHARGING PUMP P-18A,B,C
LICENSEE SUBMITTAL: SCEW(S): 6-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated), Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Charging Pump Flow FT-212

**MANUFACTURER:** Foxboro E13DH

**QUALIFICATION DISCREPANCY:** **This component lacks documented qualification data.**

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** FT-212 function to provide flow indicatior of the charging pump discharge header on the main control panel.

**This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.**

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ITEM NO. 37
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL 555
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LPSI FLOW MONITORING (FT-312, 322, 332, 342)
SERVICE: LPSI FLOW TO RCS LOOP 1, 2, 3 & 4
LICENSEE SUBMITTAL: SCEW(S): 11-D
FUNCTION (PLANT ID): SHUTDOWN COOLING FLOW MONITORING (FT-306)
SERVICE: SHUTDOWN HEATER EXCHANGE FLOW/LPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 10-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated), Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** LPSI Pump Discharge Flow FT-312,322,332,342

**MANUFACTURER:** G.E. MAC-555

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** These components function to provide flow indication of LPSI pumps flow to the RCS loops on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

**EQUIPMENT:** Shutdown Cooling Flow FT-306

**MANUFACTURER:** G.E. MAC-555

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** FT-306 function to provide flow indication of the shutdown cooling flow on the main control panel and provides a control signal to the shutdown cooling bypass throttle valve to control the rate of flow for shutdown cooling. Manual control of the shutdown cooling bypass valve also allows the operating personnel with control.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for ~~concurrence~~/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

__X__ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

LPSI flow indication is needed so that the operator can verify that low-pressure injection is performing its post-accident function. This indication must be qualified for its post-accident environment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ITEM NO. 38
RTD LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
ROSEMOUNT MODEL 104ADA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RCS LOOP #1 COLD LEG TEMPERATURE (TE-115)
SERVICE: RCS LOOP COLD LEG
LICENSEE SUBMITTAL: SCEW(S): 4-D
FUNCTION (PLANT ID): RCS LOOP #2 COLD LEG TEMPERATURE (TE-125)
SERVICE: RCS LOOP COLD LEG
LICENSEE SUBMITTAL: SCEW(S): 5-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3E

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** RCS Loop 1B Cold Leg Temp. Element TE-115

**MANUFACTURER:** Rosemount 104 Series

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** TE-115 function to provide "B" cold leg temperature signal to a wide range temperature recorder on the main control panel and provides temperature indication on the hot shutdown control panel. During plant shutdown it provides a control signal to the pressurizer relief (solenoid operated) isolation valve for overpressure protection when the shutdown cooling system is initiated. The overpressure protection for the shutdown cooling system is provided for in the plant operating procedures and ensured through administrative controls. Wide range monitors are also available to provide operating personnel with pressurizer pressure indication for shutdown cooling system initiation.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3E

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** RCS Loop 2A Cold Leg Temp. Element TE-125

**MANUFACTURER:** Rosemount 104 Series

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** TE-125 function to provide "A" cold leg temperature signal to a wide range temperature recorder on the main control panel and provides temperature indication on the hot shutdown control panel. During pla t shutdown it provides a control signal to the pressurizer relief (solenoid operated) isolation valve for overpressure protection when the shutdown cooling system is initiated. The overpressure protection for the shutdown cooling system provided for in the plant operating procedures and ensured through administrative controls. Wide range monitors are also available to provide operating personnel with pressurizer pressure indication for shutdown cooling system initiation.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3A

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ITEM NO. 39
RTD LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-9
ROSEMOUNT MODEL 108MB42BB
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN COOLING TEMPERATURE MONITORING (TE-351X,Y)
SERVICE: SHUTDOWN COOLING SYSTEM
LICENSEE SUBMITTAL: SCEW(S): 12-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
(III.b Not in Scope)
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | X |
| IV | Documentation Not Made Available | |

EQUIPMENT REQUIRED FOR COLD SHUTDOWN

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Shutdown Cooling Temperature TE-351X,Y

**MANUFACTURER:** Rosemount 180 Series

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** TE-351X & Y function to provide temperature indication of the shutdown cooling flow on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (~~NRC Qualification Evaluation Category IIIa~~)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ITEM NO. 40
RTD LOCATED IN THE CONTAINMENT, ELEV. 38'6", FIRE ZONE C-5
ROSEMOUNT MODEL 104WC88AX
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 40
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER VAPOR PHASE TEMPERATURE (TE-109)
SERVICE: PRESSURIZER VAPOR TEMPERATURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 3-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
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| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

__X__ The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- ___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- ___ Corrective action specified by the Licensee:
  - ___ Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- ___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

__X__ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

LICENSEE RESPONSE TO NRC SER

EQUIPMENT: Pressurizer Vapor Phase Temp. Element TE-109

MANUFACTURER: Rosemount 104 Series

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: TE-109 function to provide temperature indication of the steam phase in the pressurizer on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

## SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

### Reason for Concurrence

- [X] Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- [ ] Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- [ ] Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

### Reason for Non-Concurrence

- [ ] Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- [ ] Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- [ ] Backup (equipment/system) is subject to a potentially disabling single active failure.
- [ ] Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- [ ] Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- [ ] Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ITEM NO. 41
ELECTRICAL INDICATOR LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 180
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 41
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): STEAM GENERATOR AUXILIARY FEED PUMP TURBINE SPEED INDICATOR (SI-4194A)
SERVICE: STEAM GENERATOR AUXILIARY FEED PUMP H-21
LICENSEE SUBMITTAL: SCEW(S): 13-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4L

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Steam Generator Aux. Feedwater Pump (P-4) Turbine Speed SI-4194A

**MANUFACTURER:** G.E. 180 Series

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** SI-4194A function to provide speed indication of the steam generator aux. feedwater pump turbine on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ITEM NO. 42
ELECTRICAL CONDUCTOR MODULES LOCATED IN THE CONTAINMENT
CONAX MODEL N1100132/N1100133
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 42
LICENSEE REFERENCE(S): 2178, 4296
FUNCTION (PLANT ID): PROVIDE A SEALED CABLE ENTRANCE FOR SMLS'S
SERVICE: VALVE LIMIT SWITCHES
LICENSEE SUBMITTAL: SCEW(S): 12-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable) New item

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, ~~5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NOTES: This equipment was previously evaluated for NNECO for the Millstone 1 plant in TER C5257-459 which stated:



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

Equipment Item No. 82
Electrical Connector Located in the Drywell
Conax Model N-11001-32
Connection and Seal for MSIV Limit Switches (1-MS-1A, B, C, D; 1CU-2A)
Licensee Reference 1178
Required Operating Time: Continuous
TER Checksheet No. 82
Reference 19, Section 4.3.1.2
Licensee Submittal: Page III-7 [22]



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = SPECIFIC ENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. 2) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

This equipment item was previously evaluated in Reference 19. See page 1A Equipment Item description.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ITEM NO. 43
ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT, ELEV. 38'6"
LITTON MODEL C1R06V12015S/C1R02V12015P
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 43
LICENSEE REFERENCE(S): 6228
FUNCTION (PLANT ID): ELECTRICAL CONNECTOR (RC414, 415, 416, 417, 422, 423, 424, 425)
SERVICE: RCS VENTING SOLENOID VALVES
LICENSED SUBMITTAL: SCEW(S): 35A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, ~~5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| (I.a Qualified) | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

Response to TER concerns.

Scews 35A, Reference 1 was provided by Litton as applicable to the Millstone Unit 2 connectors.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NOTES: This item was previously evaluated for NUSCO for the Haddam Neck plant (TER-C5257-460) which stated:



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ITEM NO. 50
ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT
LITTON MODEL CIR06VI2015S (PLUG) AND CIR02VI2015P (RECEPTACLE)
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): 900
REFERENCE 25, SECTION 4.3.1.4, FORMER ITEM 46
FUNCTION (PLANT ID): ELECTRICAL CONNECTION FOR SOLENOID VALVES SOV596 A,B,C,D; SOV 552A,B,C,D
LICENSEE SUBMITTAL: SCEW(S): A-10-34 [30]



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: / = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

This equipment item was previously evaluated in Reference 25. See page 1A Equipment Item description.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ITEM NO. 44
PRESSURE SWITCH LOCATED IN THE ZONE T11
CUSTOM COMPONENT MODEL CCS604GR6356S
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 44
LICENSEE REFERENCE(S): 3521, 30
FUNCTION (PLANT ID): TURBINE TRIP (PS-4597 A, B, C, D)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 14-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g,~~ 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 830630.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

This equipment will be replaced with fully qualified devices.

EQUIPMENT: Pressure Switches PS-4597A, B, C, D
High pressure turbine - hydraulic fluid pressure

MANUFACTURER: Custom Component Switches (CCS)

QUALIFICATION DISCREPANCY: These components lack documented time/temperature aging qualification data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

These components function to cause a reactor trip on loss of turbine hydraulic fluid pressure.

Due to the present age of this equipment, and to the severity of the environmental test on this equipment in the as new condition, reasonable assurance is provided that the equipment will perform its design function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

The licensee has provided a seismic test report as evidence of qualification. This report does not provide any evidence of environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ITEM NO. 45
PRESSURE TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 7'0"
FOXBORO MODEL E11
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 45
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): ESAS & REACTOR PROTECTIVE SYSTEM AND ACCIDENT MONITORING (PT102 A, B, C, D)
SERVICE: PRESSURIZER PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 32A
FUNCTION (PLANT ID): ESAS & REACTOR PROTECTIVE SYSTEM AND ACCIDENT MONITORING (PT-1013 A, B, C, D; PT-1023 A, B, C, D)
SERVICE: STEAM GENERATOR PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 31-A
FUNCTION (PLANT ID): PRESSURIZER HEATER CONTROL ACCIDENT MONITORING (PT-100X, Y)
SERVICE: PRESSURIZER PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 27A
FUNCTION (PLANT ID): LOW RANGE PRESSURIZER PRESSURE (PT-103)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 2-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, QT, RT, P, H, (CS) (A) S, (R), M, I, QM, (RPN) EXN, (SEN) QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


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| Licensee Response to NRC SER | 3a, 3b, 3c, 3d, 3e |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (~~has~~/has ~~not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| | NRC QUALIFICATION CATEGORY | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

PT-103

Response to SER concerns. (CS, R-SEN, RPN)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** Low Range Pressurizer Pressure Transmitters PT-103

**MANUFACTURER:** Foxboro E-11GM

**QUALIFICATION DISCREPANCY:**

This equipment lacks documented qualification data concerning resistance to chemical spray and radiation exposure.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

PT-103 provides signal input for the post accident monitoring, subcooling margin monitor. This component serves as post accident low range presurizer pressure monitor This equipment also functions to provide overpressure protection for the shutdown cooling system.

The post accident subcooling margin monitor, will alarm a pressure input failure which indicates to the operator that this system should not be used for any safety related function.

The overpressure protection for the shutdown cooling system is provided for in the plant operating procedures and ensured through administrative controls. Wide range monitors are also available to provide operating personnel with pressurizer pressure indication for shutdown cooling system initiation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

PT-102A,B,C&D

Response to SER concerns. (R, CS-SEN, RPN, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** PRESSURIZER PRESSURE (SAFETY MEASUREMENT CHANNELS) PT-102A, B, C, D

**MANUFACTURER:** Foxboro E-11 Pressure Transmitters
S/N 2602023, 2602024, 2602025, 2602026

**QUALIFICATION DISCREPANCY:** This equipment lacks documented qualification concerning their resistance to chemical spray, radiation and time/temperature aging.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide the initiating signal for a reactor trip due to a high pressurizer pressure condition. The trip delay time for this function is 0.9 second in accordance with technical specification requirements. When a low pressurizer pressure condition exists these instruments provide input signals for engineered safety features actuation of ECCS, containment isolation and enclosure building filtration. Component location and the cable termination method preclude the possibility of the rapid admission of steam or fluid to the component internals during a LOCA. These components are required to mitigate the consequences of a LOCA. Their operability requirements ends within the first few seconds of the accident, and as such receives only a fraction of the LOCA radiation dose prior to operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

PT-1013/1023 A, B, C, D

Response to SER concerns. (R, CS-SEN, RPN, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** STEAM GENERATOR PRESSURE (PROTECTIVE MEASUREMENTS CHANNELS)
PT-1013/1023 A, B, C, D

**MANUFACTURER:** Foxboro E-11 Pressure Transmitter
S/No's 2602030, 2602031, 2602032, 2602033, 2602034, 2602035, 2602036, 2602037

**QUALIFICATION DISCREPANCY:**

This equipment lacks documented qualification concerning their resistance to chemical spray, radiation and time/temperature aging.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide the initiating signal for a reactor trip on a low steam generator pressure condition. These instruments also provide input signals for engineered safety features actuation of main steam and feedwater line isolation on a low steam generator pressure condition (main steam line break). The trip delay time for the reactor trip is 0.9 seconds in accordance with Tech. Spec. requirements. The trip delay time is defined as the elapsed time between the time when the set point condition exists at the sensor and the time when the trip breakers are open for the CEA hold coils. The method of cable termination of these components precludes the possibility of admission of steam or fluid to the component internals during a steam line break. These components are subject to a borated water spray due to initiation of containment spray caused by a high containment pressure condition, but not before sufficient time has elapsed (0.9 seconds) for these components to perform their intended functions; reactor trip mainsteam and feedwater isolation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

PT-100 X,Y

Response to SER concerns. (RPN, R, CS-SEN, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** PT-100X, 100Y; PRESSURIZER PRESSURE, CONTROL MEASUREMENT CHANNELS

**MANUFACTURER:** FOXBORO Model E11GM S/N 2602021, 2602022

**QUALIFICATION DISCREPANCY:** These components lack documented qualification concerning their resistance to chemical spray, radiation and time/temperature aging.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

PT-100Y provides signal input for the post accident monitoring, subcooling margin monitor. Both these components initiate control signals which automatically energize or de-energize pressurizer heaters on a low or high pressurizer pressure condition. These components also provide control room pressurizer pressure indication.

The post accident subcooling margin monitor, will alarm a pressure input failure which indicates to the operator that this system should not be used for any safety related function. The automatic control of pressurizer heaters is a function which can be accomplished manually from the control room. An alternate method for determining primary plant pressure is provided by charging pump discharge pressure, and these components are not required for mitigation of a Chapter 15 Design Basis Event.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ITEM NO. 46
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17 AND A18
FOXBORO MODEL NE11GM11C1LCF
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 46
LICENSEE REFERENCE(S): 919, 1157, 711
FUNCTION (PLANT ID): WIDE RANGE PRESSURE INDICATION (PT-8238, 8239)
SERVICE: POST ACCIDENT MONITORING
LICENSEE SUBMITTAL: SCEW(S): 121-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

### LICENSEE RESPONSE TO NRC SER

Response to SER concerns.(A)

This equipment will be replaced with fully qualified devices

**EQUIPMENT:** Containment Pressure Transmitters PT-8238, 8239

**MANUFACTURER:** Foxboro Model NE11GM-11C1-L-C-F

**QUALIFICATION DISCREPANCY:** These components lack documented radiation and time/temperature aging qualification.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment functions to provide wide range post accident indication of containment pressure.

Due to the present age of this equipment, and to the severity of the environmenta test on this equipment in the as new condition, reasonable assurance is provided that the equipment will perform its design function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

### GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'10", ZONE A17 AND A18
FOXBORO MODEL E11DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 47
LICENSEE REFERENCE(S): 3525, 1171
FUNCTION (PLANT ID): NOT STATED (PT-8113, 8114, 8115, 8116)
SERVICE: CONTAINMENT PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 91-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns.(A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** Containment Pressure Transmitters PT-8113, 8114, 8115, 8116

**MANUFACTURER:** Foxboro Model E11-DM

**QUALIFICATION DISCREPANCY:** These components lack documented qualifications concerning time/temperature aging.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides signal input for engineered safety features actuation of the containment spray, enclosure building filtration, containment isolation and emergency core cooling systems on a high containment pressure condition. The catalog specifications for this equipment envelop the environmental parameters experienced by these components during the accident, therefore, the environment will not impair these components in performance of their safety function.

Two additional environmentally qualified channels of containment pressure monitoring have been installed for post accident monitoring.

Due to the present age of this equipment, and the severity of the as new test, assurance is provided that the equipment will perform its function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

LICENSEE RESPONSE TO NRC SER

GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ITEM NO. 48
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A51
GE/MAC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): INITIATING SIGNAL FOR STEAM GENERATOR ATMOSPHERIC DUMP (PT-4224)
SERVICE: STEAM GENERATOR PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 36-BA
FUNCTION (PLANT ID): INITIATING SIGNAL FOR STEAM GENERATOR ATMOSPHERIC DUMP (PT-4223)
SERVICE: STEAM GENERATOR PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 36-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, J, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated), Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 830630.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b Modification) | III.a Exempt |
| I.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns (RPN, T, R, A, QM,)

This equipment will be replaced with fully qualified devices

**EQUIPMENT:** STEAM GENERATOR PRESSURE TRANSMITTERS
PT-4223, 4224

**MANUFACTURER:** GENERAL ELECTRIC MEASUREMENT AND CONTROLS
(GE/MAC)

**QUALIFICATION DISCREPANCY:** This equipment is discrepant because it lacks documented qualification test data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide control loop input for automatic operation of the atmospheric dump valves. This subject was also discussed in the October 5, 1979 letter from W. G. Counsil to H. R. Denton. To date the staff has not responded negatively to this letter, thereby inferring concurrence with the conclusions presented therein. With the postulation of the most adverse failure of these components there is no effect upon the control room manual operation of the atmospheric dump.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

## GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ITEM NO. 49
PRESSURE TRANSMITTER LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AUXILIARY FEEDWATER PMP P-9A DISCHARGE HDR. PRESS MONITORING (PT-5289)
SERVICE: AUXILIARY FEED PUMP P-9A
LICENSEE SUBMITTAL: SCEW(S): 17-D
FUNCTION (PLANT ID): AUXILIARY FEED PUMP P-4 DISCHARGE HEADER PRESSURE (PT-5284)
SERVICE: AUXILIARY FEED PUMP P-4
LICENSEE SUBMITTAL: SCEW(S): 16-D
FUNCTION (PLANT ID): AUXILIARY FEED PUMP P-9B DISCHARGE HEADER PRESSURE (PT-5281)
SERVICE: AUXILIARY FEED PUMP P-9B
LICENSEE SUBMITTAL: SCEW(S): 14-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b~~, ~~3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

EQUIPMENT: Steam Generator Aux. Feedwater Pump (P-9A) Discharge Pressure PT-5289

MANUFACTURER: G.E. MAC-555

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: PT-5289 function to provide pressure indication of the steam generator aux. feedwater pump discharge on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT: Steam Generator Aux. Feedwater Pump (P-4) Discharge Pressure PT-5284

MANUFACTURER: G.E. MAC-555

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: PT-5284 function to provide pressure indication of the steam generator aux. feedwater pump discharge on the main control panel.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

LICENSEE RESPONSE TO NRC SER

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT: Steam Generator Aux. Feedwater Pump (P-9B) Discharge Pressure PT-5281

MANUFACTURER: G.E. MAC-555

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: PT-5281 function to provide pressure indication of the steam generator aux. feedwater pump discharge pressure on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for ~~concurrence~~/ non-concurrence with the technical basis of tne Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

XX The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

Auxiliary feedwater pump discharge pressure provides the operator with indication that the AFW system is performing as intended. The AFW system is needed to maintain the hot-shutdown condition, as well as to transition to a cold-shutdown condition. Since this equipment is needed to maintain decay heat removal capability in hot-shutdown, it should be qualified for its post-accident environment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ITEM NO. 50
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-2
GENERAL ELECTRIC MODEL MAC551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LPSI PUMP 1 & 2 HEADER PRESSURE (PT-302X,Y)
SERVICE: LPSI PUMP 1 & 2
LICENSEE SUBMITTAL: SCEW(S): 9-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
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| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j.~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

LICENSEE RESPONSE TO NRC SER

EQUIPMENT: LPSI Pump Discharge Press. PT-302X,Y

MANUFACTURER: G.E. MAC-551

QUALIFICATION DISCREPANCY: These components lack documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: PT-302X & Y function to provide discharge pressure indication of each (P-42A & B) LPSI pump on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for ~~concurrence~~/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

_X_ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

LPSI pump discharge pressure indication is necessary to ensure that low-pressure injection is performing its design function. This equipment must be qualified for its post-accident environment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ITEM NO. 51
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL MAC551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 51
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VOLUME CONTROL TANK PRESSURE (PT-225)
SERVICE: VOLUME CONTROL TANK T-5
LICENSEE SUBMITTAL: SCEW(S): 7-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

__X__ The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

__X__ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Volume Control Tank Pressure PT-225

**MANUFACTURER:** G.E. MAC-551

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** PT-225 function to provide pressure indication of the volume control tank on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- [X] Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- [ ] Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- [ ] Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- [ ] Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- [ ] Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- [ ] Backup (equipment/system) is subject to a potentially disabling single active failure.
- [ ] Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- [ ] Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- [ ] Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ITEM NO. 52
PRESSURE TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
FISCHER AND PORTER MODEL 50EP1042BCSA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 52
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER PRESSURE LOW RANGE (PT-103-1)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 1-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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|---|---|
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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
(III.b Not in Scope)
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | X |
| IV | Documentation Not Made Available | |

EQUIPMENT REQUIRED FOR COLD SHUTDOWN

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Narrow Range Pressurizer Pressure Transmitter PT-103-1

**MANUFACTURER:** Fisher Porter 50EP Series

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** PT-103-1 function to provide a alarm signal of the pressurizer pressure on the main control panel and provides pressure indication on the hot shutdown control panel. During plant shutdown it provides a control signal to the shutdown cooling and safety injection tank isolation valves to open/close as part of a series of operations which bring the reactor from a hot standby to cold shutdown.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

### SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

**Reason for Concurrence**

- [X] Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (~~NRC Qualification Evaluation Category IIIa~~)
- [ ] Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- [ ] Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

**Reason for Non-Concurrence**

- [ ] Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- [ ] Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- [ ] Backup (equipment/system) is subject to a potentially disabling single active failure.
- [ ] Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- [ ] Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- [ ] Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ITEM NO. 53
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-3
GENERAL ELECTRIC MODEL 555
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 53
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER SHELL SIDE FLOW MONITORING (FT-6042)
SERVICE: SHUTDOWN HEAT EXCHANGER X23B
LICENSEE SUBMITTAL: SCEW(S): 21-D
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER SHELL SIDE FLOW MONITORING (FT-6043)
SERVICE: SHUTDOWN HEAT EXCHANGER X23A
LICENSEE SUBMITTAL: SCEW(S): 22-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

EQUIPMENT: Shutdown Heat Exchanger (X-23B) Flow FT-6042, FT-6043

MANUFACTURER: G.E. MAC-555

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: FT-6042 function to provide flow indication of the shutdown heat exchanger shellside on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: FT-6043 function to provide flow indication of the shutdown heat exchanger shellside on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54
D/P TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 5'0"
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 54
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): PZR HEATER CONTROL CHARGING PUMP CONTROL ACCIDENT MONITORING (LT-110X, LT-110Y)
SERVICE: PRESSURIZER LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 30-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, QT, RT, P, H, (CS) (A) S, (R), M, I, QM, RPN, EXN, (SEN) QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (R, CS-SEN, A)

This equipment is to be replaced with fully qualified devices.

**EQUIPMENT:** Pressurizer level (control measurement channels) LT-110X, 110Y differential pressure transmitters

**MANUFACTURER:** FOXBORO E13DH S/N 2648245, 2648246

**QUALIFICATION DISCREPANCY:** These components lack documented qualification concerning their resistance to chemical spray, radiation and time/temperature aging.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides, charging pump control circuit input which de-energizes all but one charging pump on a high pressurizer level condition, and control room indication. These components also provide signals which energize or de-energize all pressurizer heaters on a high or low-low level condition respectively. A low pressurizer level signal from these components also provides a backup signal to start all charging pumps. This equipment provides control signals only and is not required for mitigation of a Chapter 15 Design Basis Event. The control functions described above can be manually performed from the control room in the event of a worse case component failure.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

## GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ITEM NO. 55
D/P TRANSMITTER LOCATED IN THE ZONE A-51
FOXBORO MODEL NE13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 55
LICENSEE REFERENCE(S): 919, 1157, 711
FUNCTION (PLANT ID): AUXILIARY FEED FLOW INDICATION (FT-5277, 5278)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 8-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (QT) RT, P, H, CS, (A) S, (R), M, I, (QM) RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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|---|---|
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| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

## LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (QI, R, QT, A, T, QM)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** Differential pressure transmitters for auxiliary feedwater flow indication FT-5277, 5278

**MANUFACTURER:** Foxboro Model NE-13DH

**QUALIFICATION DISCREPANCY:** These components lack documented radiation and time/temperature aging qualification.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide indication of auxiliary feedwater flow. An independent laboratory has been contracted by NUSCO to provide radiation and time/temperature aging analysis of this equipment.

Due to to present age of this equipment, and severity of the as new test, reasonable assurance is provided that the equipment will perform its function

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

## GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ITEM NO. 56
D/P TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 14'6"
FOXBORO MODEL E13DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 919, 1171, 1157, 1772
FUNCTION (PLANT ID): INPUT FOR 3 ELEMENT FEEDWATER CONTROL ACCIDENT MONITORING (LT-5274, LT-5272)
SERVICE: STEAM GENERATOR LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 28A
FUNCTION (PLANT ID): RPS INPUT & ACCIDENT MONITORING (LT-1113A, LT-1123A)
SERVICE: STEAM GENERATOR LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 29A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 6/30/83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b) Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** STEAM GENERATOR LEVEL MONITORING, DIFFERENTIAL PRESSURE TRANSMITTERS LT-5272, 5274

**MANUFACTURER:** FOXBORO E-13DM S/N 3220857, 3220858

**QUALIFICATION DISCREPANCY:** Time/temperature aging is not addressed in the manufacturer's qualification test reports.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide signal input for the 3 element feedwater control system and control room steam generator level indication. The specification for these components identified 40 years as the desired design life.

Due to the present age of this equipment, and to the severity of the environmental test on this equipment in the as new condition, reasonable assurance is provided that the equipment will perform its design function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

## LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** STEAM GENERATOR LEVEL MONITORING, DIFFERENTIAL PRESSURE TRANSMITTERS LT1113A, 1123A

**MANUFACTURER:** FOXBORO E-12DM S/N 3220855, 3220856

**QUALIFICATION DISCREPANCY:** Time/temperature aging is not addressed in the manufacturer's qualification test reports.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These component provide RPS input for a reactor trip on low steam generator level, and control room steam generator level indication. The specification for these components identified 40 years as the desired design life.

Due to the present age of this equipment, and to the severity of the environmental test on this equipment in the as new condition, reasonable assurance is provided that the equipment will perform its design function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

## GENERIC REPLACEMENT SCHEDULES

No. 2 The present delivery schedule for the replacement equipment in this group is not compatible with the next planned refueling outage currently scheduled to commence in December 1981. The replacement will occur no later than the first refueling outage following the receipt of fully qualified components. This will be accomplished by June 1983, assuming procurement and installation delays do not preclude replacement by that date. In the event of the latter, justification for an extended implementation schedule will be provided in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ITEM NO. 57
LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 22'6", 15'6"
GEMS MODEL XM548532841500
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMNET SUMP LEVEL INDICATION (LT-8242, 8243)
SERVICE: POST ACCIDENT MONITORING
LICENSEE SUBMITTAL: SCEW(S): 16-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), (S), (R), M, I, QM, RPN, EXN, SEN, (QI) RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (~~has~~/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - ___ Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - X Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 81103!.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

**Notes:** a. This equipment is purchased on a risk release basis pending completion of vendor qualification testing and NUSCO review and acceptance of the final test reports. The target date for receipt of the vendor's final test report is 10-81. The qualification documentation references will be identified at that time.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ITEM NO. 58
LEVEL TRANSMITTER LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONDENSATE STORAGE TANK LEVEL MONITORING (LT-5282)
SERVICE: CONDENSATE STORAGE TANK
LICENSEE SUBMITTAL: SCEW(S): 15-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
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| Equipment Item | 1a |
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| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

LICENSEE RESPONSE TO NRC SER

EQUIPMENT: Condensate Storage Tank Level LT-5282

MANUFACTURER: G.E. MAC-551

QUALIFICATION DISCREPANCY: This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: LT-5282 function to provide a level signal of the condensate storage tank to a recorder on the main control panel and provides level indication on the hot shutdown control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ITEM NO. 59
LEVEL TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL 555111BCAA3ABA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VOLUME CONTROL TANK LEVEL MONITORING (LT-226)
SERVICE: VOLUME CONTROL TANK T-5
LICENSEE SUBMITTAL: SCEW(S): 8-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated), Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- ___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- ___ Corrective action specified by the Licensee:
  - ___ Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- ___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | (III.b Not in Scope) |
| II.b Not Qualified | IV Documentation Not Available |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | X |
| IV | Documentation Not Made Available | |

EQUIPMENT REQUIRED FOR COLD SHUTDOWN

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Volume Control Tank Level LT-226

**MANUFACTURER:** G.E. MAC-555

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** LT-226 function to provide level indication of the volume control tank (VCT) on the main control panel and provides a control signal to the makeup control for make up to the VCT to maintain the proper level. Manual valve line up and manual start of the boric acid pumps also allows the operating personnel with makeup control for manual make up to the VCT to maintain the proper level.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (~~NRC Qualification Evaluation Category IIIc~~)
- ___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- ___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- ___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- ___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- ___ Backup (equipment/system) is subject to a potentially disabling single active failure.
- ___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- ___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ITEM NO. 60
LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): PRESSURIZER LEVEL 0-100% (LT-103)
SERVICE: PRESSURIZER LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 2-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h~~, 5i, 5j |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | X |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | X |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | X |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Pressurizer Level Transmitter LT-103

**MANUFACTURER:** Foxboro E13DH Series

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY: LT-103 function to provide wide range indication of the pressurizer level on the main control panel, during plant startup and shutdown.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment. Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for ~~concurrence~~/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

XX This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

XX The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

Pressurizer level indication is necessary in a post-accident condition to enable the operator to verify the proper operation of certain ECCS systems. In a small-break LOCA or MSLB inside containment, pressurizer level indication is a significant parameter from the standpoint of plant operation and accident mitigation. The licensee has not justified the statement that pressurizer level indication is exclusively to facilitate the transition from hot standby to cold shutdown.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION | | | |
| Equipment Type | Level Transmitter | Pressure Transmitters | |
| Manufacturer's Name (5.2.2/-/-) | Foxboro | Foxboro | |
| Model Number (5.2.2/-/-) | E13DH | E13DM-KAM-2, E11GM-SAB-2 | Note 2 |
| Serial Number | Not stated | E11GH-INM-5 | (X) |
| Features/Mounting (5.2.6/-/-) | | MCA Modified | |
| Connections/Interfaces (5.2.6/-/-) | | | |
| Location/Elevation | Containment | | |
| Equipment ID No. | LT-103 | | |
| QUALIFICATION REPORT (8.0/5.0/5.0) | | | |
| Report ID Number | Q9-6005 | Q9-6005 | |
| Report Date | | April, 1971 | |
| Issued by | Foxboro | Foxboro | |
| Prepared for | | | |
| Referenced Reports | | | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | Test | Test | |
| QUALIFICATION TEST PROGRAM | | | |
| Functional Test Description (5.2.5/2.2.9/2.2.9) | | Four calibration checks during test. (See page 5i) | |
| Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq. | | Input maintained at 50 "$H_2O$ | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Not stated | |
| Accuracy (5.2.5/-/-) | ± 0.5 % | | See Note 1 (x) |
| Number of Specimens | | 6 (exc. EMGH had 1) | |
| Test Instruments Calibrated | | Yes | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Active | | |
| Test Duration (5.2.1/-/-) | | 28 hours | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | 3 hours | | |
| Required Function Time | continuous | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Baseline / DBE exposure / Inspection | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | | Not performed | |
| Material Aging Evaluation (7.0/-/-) | | | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | | | |
| Radiation Aging, Type | | | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | | Not performed | |
| Radiation Aging, Dose Rate | | | |
| Radiation Aging, Method | | | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | | | |
| Operational Aging (-/4.2/-) | | | |
| Other Age Conditioning (-/4.2/-) | | | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 40 years | | Not justified. (X) |
| Normal Ambient Temperature<br>Normal Ambient Radiation<br>Normal Ambient Humidity | | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | | |
| Margin (General) (6.0/3.0/3.0) | | | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | LOCA | Maximum Credible Accident | |
| Radiation Type | | Not performed | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $8.2 \times 10^6$ R | | X |
| Radiation Dose Rate (rd/hr) | | | |
| Radiation Qual. Method (5.3.1/-/-) | | | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | | | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | | | |
| Plateout Dose Considered (-/1.48/1.48) | | | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | See profiles, page 5j | See profile, page 5i | |
| Peak: °F/psig/RH/Time | ↓ | ↓ | |
| Decrease To: °F/psig/RH/Time | ↓ | ↓ | |
| Decrease To: °F/psig/RH/Time | ↓ | ↓ | |
| Decrease To: °F/psig/RH/Time | ↓ | ↓ | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | | | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | | Not performed | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 ppm Boron | | X |
| Spray Density (gpm/ft$^2$) | | | |
| Spray Duration | | | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | N/A | | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | ↓ | ↓ | |
| Time to Submergence | ↓ | ↓ | |
| Dust Environment (-/2.2.11/2.2.11) | ↓ | ↓ | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

NOTES:

1. The test report [2115] describes the demonstrated accuracy of the transmitters as follows:

Upon initiating the first phase (318F 90 psi) of MCA, the E13DMs and E11GMs go through a ±4% transient, then stabilize at a negative output shift within the first 20 minutes.

Output shifts for the E13DM and E11GM transmitters were generally <5% with a few exceptions.

Output errors or shifts were generally 2% or less when returned to room ambient conditions.

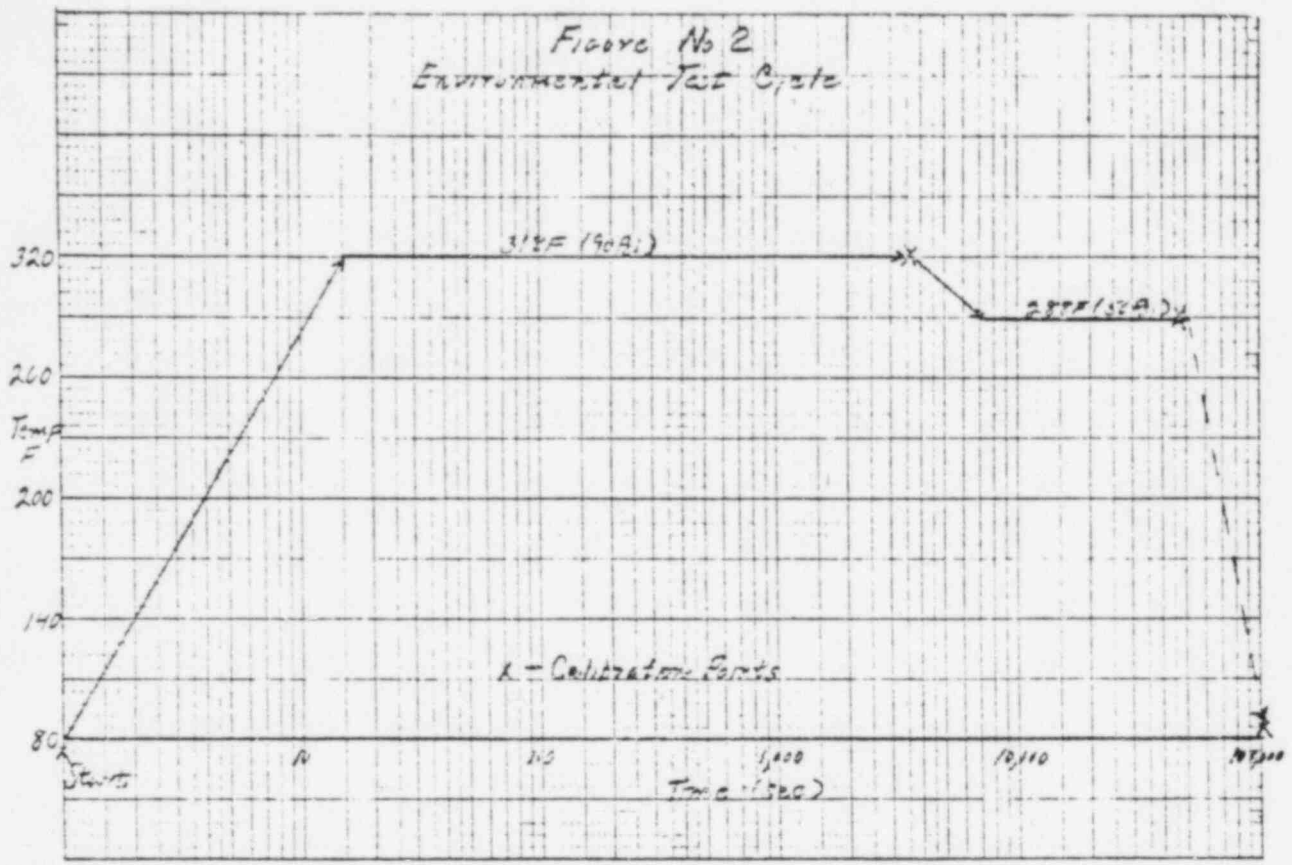
The transient response of the E11GH during the first few minutes after the initial steam-air changing was -15% and settling at a -12% shift. Recovery to room ambient conditions was 0.25% or less.

These output shifts exceed the 0.5% accuracy specified by the licensee.

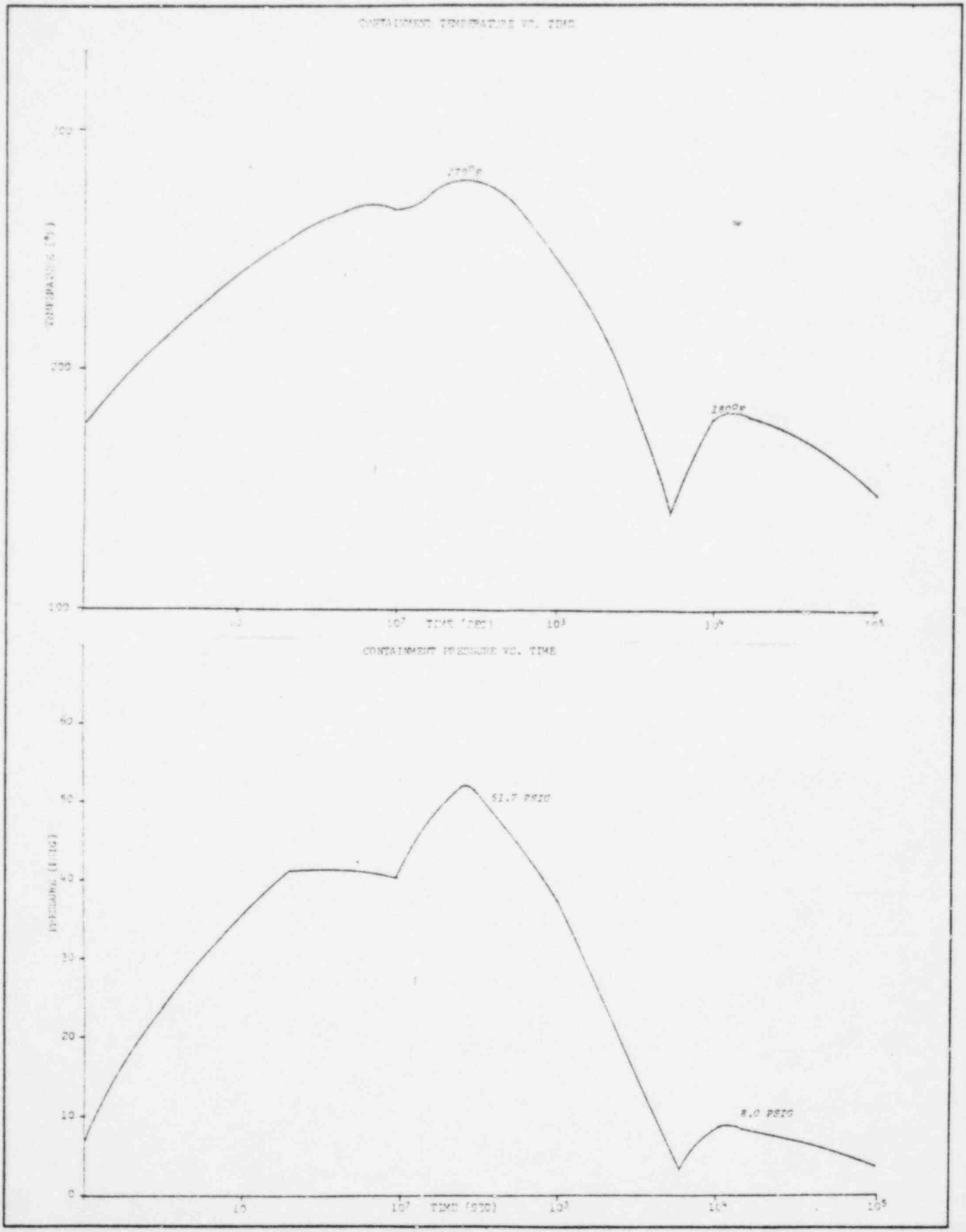
2. The transmitters tested by Foxboro were modified to withstand a Maximum Credible Accident (MCA). The licencee has not identified the plant equipment as MCA-modified transmitters, and therefore similarity is questionable.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

NOTES:



## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60



# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ITEM NO. 61
LEVEL TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 71'0"
FOXBORO MODEL E13DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RBCCW SURGE TANK LEVEL MONITORING (LT-6001)
SERVICE: RBCCW SURGE TANK
LICENSEE SUBMITTAL: SCEW(S): 18-D
FUNCTION (PLANT ID): RBCCW SURGE TANK LEVEL MONITORING (LT-6730)
SERVICE: RBCCW SURGE TANK T-3
LICENSEE SUBMITTAL: SCEW(S): 24-D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, ~~4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** RBCCW Surge Tank Level LT-6001, LT-6730

**MANUFACTURER:** Foxboro E-13DM

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** function to provide level indication of the RBCCW surge tank on the main control panel.

This equipment is required to function after a design basis event exclusively to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ITEM NO. 62
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-2
NAMCO MODEL EA17031100
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER BYPASS TO MAIN LPSI HEADER (ZS-657)
SERVICE: SHUTDOWN COOLING FLOW CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 47-BA

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** Stem Mounted Limit Switch ZS-657 Shutdown Cooling Flow Control Valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** This component lacks documented qualification data.

**FUNCTION AND JUSTIFICATION FOR NOT QUALIFYING A COMPONENT ENVIRONMENTALLY:** This equipment provides contacts for control circuit input and position indication for shutdown cooling flow control valve. They are all located outside the containment and are subject to an environment which is enveloped by the equipment catalog specification, therefore, the environment will not impair these components in performance of their attended function.

This equipment is required to function after a design basis event to provide indication to operations personnel to facilitate the transition from hot standby to cold shutdown. The current licensing basis for Millstone Unit No. 2 does not include the capability to achieve cold shutdown using class IE equipment Corrective measures could be taken, as required in the event of inoperability of "indication only" devices.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for ~~concurrence~~/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page___)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

X The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

THE LICENSEE HAS INDICATED THAT THE LIMIT SWITCH IS USED IN CONTROL CIRCUITS, BUT HAS NOT PRESENTED AN ANALYSIS OF THE ELECTRICAL FAILURE MODES OF THE DEVICE. IN ADDITION, THE LICENSEE'S EXPLANATION APPEARS TO BE INCONSISTENT, IN THAT THE DEVICE MAY BE REQUIRED TO OPERATE AFTER A DESIGN BASIS EVENT. THE LICENSEE FURTHER STATES THAT THE VALUE IS LOCKED CLOSED. ACCESS TO THIS AREA WOULD BE LIMITED BY THE $2.29 \times 10^6$ RADIATION LEVEL DURING A DBE.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ITEM NO. 63
LIMIT SWITCH LOCATED IN THE CONTAINMENT
NAMCO MODEL EA180
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): VALVE CONTROL, INTERLOCKS AND POSITION INDICATION (VARIOUS)
SERVICE: VARIOUS AIR OPERATED AND MOTOR OPERATED VALVES
LICENSEE SUBMITTAL: SCEW(S): 10-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, (QM), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | X |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION | | | |
| Equipment Type | LIMIT SWITCH | Limit Switch | |
| Manufacturer's Name (5.2.2/-/-) | NAMCO CTLS. | NAMCO Controls | |
| Model Number (5.2.2/-/-) | EA180 | EA-180, Type 23 | |
| Serial Number | NOT STATED | EA-180-11302,Rev.-D | |
| Features/Mounting (5.2.6/-/-) | ON VALVES | Horizontal in Autoclave | |
| Connections/Interfaces (5.2.6/-/-) | NOT STATED | Teflon Tape used to seal conduit threads | X See Note 1 |
| Location/Elevation | IN CONTAINMENT EL E) 14'4" | Not Applicable | |
| Equipment ID No. | See 1a | Not Applicable | |
| QUALIFICATION REPORT (8.0/5.0/5.0) | | | |
| Report ID Number | 17436-3 | No Report I/D Number | SEE NOTE 3 |
| Report Date | 10/13/80 | September 5,1978 | |
| Issued by | WYLE LABS | ACME CLEVELAND DEVELOPMENT COMPANY | |
| Prepared for | NUSCO | NAMCO CONTROLS | |
| Referenced Reports | NAMCO (No ID) 9/5/78 | Not Stated | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | TEST | Sequential Test | |
| QUALIFICATION TEST PROGRAM | | | |
| Functional Test Description (5.2.5/2.2.9/2.2.9) | — | Make/break contact | |
| Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq. | NOT STATED | 0.5Amps @ 100 Vdc | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Not Stated | |
| Accuracy (5.2.5/-/-) | | Not Stated | |
| Number of Specimens | | One (1) | |
| Test Instruments Calibrated | | Yes | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | ACTIVE | Active | |
| Test Duration (5.2.1/-/-) | | 30 days | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | NOT STATED | Not Applicable | |
| Required Function Time | NOT STATED | Not Applicable | NOTE 4 |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Inspection/Base line data | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | Heat/Humidity Aging<br>Mechanical Aging<br>Irradiation<br>Seismic testing<br>LOCA Simulation | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) | | | |
| Thermal Aging/Basis | ANALYSIS | 200 hours @ 200°F per ANSI draft std N278.2.1 | X Note 2 |
| Material Aging Evaluation (7.0/-/-) | ANALYSIS | Not Stated | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | YES | Not Stated | |
| Radiation Aging, Type | | Gamma | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | NOT STATED | 204 Megarads | * |
| Radiation Aging, Dose Rate | | 0.7 Megarads/ hour | |
| Radiation Aging, Method | | Test | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | NOT STATED | Not Stated | |
| Operational Aging (-/4.2/-) | | 100,000 Actuation Cycles | |
| Other Age Conditioning (-/4.2/-) | | Not Stated | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 2 YEARS BUNA-N GASKET | None Claimed | X NOTE 2 |
| Normal Ambient Temperature | 120°F | Not Applicable | |
| Normal Ambient Radiation | $5.1 \times 10^6$ RADS | Not Applicable | |
| Normal Ambient Humidity | NOT STATED | Not Applicable | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | NOT STATED | Not Applicable | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | NOT STATED | Not Applicable | |
| Margin (General) (6.0/3.0/3.0) | NOT STATED | Not Stated/ Not Appicable | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | Not Stated | |

* Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | LOCA | LOCA/MSLB | |
| Radiation Type | GAMMA | Gamma | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.9 \times 10^{12}$ RADS | 204 Megarads | * |
| Radiation Dose Rate (rd/hr) | NOT STATED | 0.7 Megarads per hour | |
| Radiation Qual. Method (5.3.1/-/-) | TEST | Test | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | NOT STATED | Not Applicable | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | NOT STATED | Not Stated | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $2.4 \times 10^{7}$ | Not Stated | |
| Plateout Dose Considered (-/1.48/1.48) | NOT STATED | Not Applicable | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | $1.5 \times 10^{8}$ RADS | Not Applicable | |

*Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | 6°F/5psi/sec | 11°F/8psi/sec | |
| Peak: °F/psig/RH/Time | 279/51.7/a/- | 340/115/100/3h4s | |
| Decrease To: °F/psig/RH/Time | See attached page, page 5h | 140/-/-/2h4r<br>340/105/100/3hrs | |
| Decrease To: °F/psig/RH/Time | | 320/76/100/2hrs<br>300/57/100/1hr | |
| Decrease To: °F/psig/RH/Time | | 250/25/100/4days<br>150/10/100/25 days | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | NOT STATED | Not Applicable | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | TEST | Test | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 PPM BORON | Boric Acid/water/sodium thiosulfate/sodium hydroxide | |
| Spray Density ($gpm/ft^2$) | NOT STATED | 0.15 | |
| Spray Duration | NOT STATED | 30Days | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | NOT STATED | Not Applicable | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | NOT STATED | Not Applicable | |
| Time to Submergence | NOT STATED | Not Applicable | |
| Dust Environment (-/2.2.11/2.2.11) | — | Not Applicable | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

NOTES:

1. The report states " The switch was mounted in the chamber in a horizontal position such that the lever shaft pointed upwards. The switch was attached by means of a threaded pipe. Teflon tape was used for sealing the pipe threads.+

+No attempt is made to qualify the connection method. These test procedures are based on the assumption that the user will ensure that no steam enters the unit via this connection during an actual LOCA."

EL

The licensee has not identified the connection method used.

2. The report states

"Heat aging. The heat aging test consisted of holding the unit suspended over water in a tank at a temperature of 200°F for 200 hours.+

+Heat aging conditions were taken from ANSI Draft Standard N278.2.1 (Draft 3, Rev. 0). The correlation between these conditions and the qualified life is not known.

The equipment qualification summary [2116] has evaluated the Buna-N gasket, Methyl vinyl Silicon rubber, and Silicone rubber gaskets with respect to loss of elongation in extrapolating the aging simulation to predict a qualified life. With respect to gaskets, the property of interest is compressive set and the aging should be evaluated with respect to this property. In addition the extrapolation with respect to the Ethylene Propylene seems unreasonably high in using an activation energy of greater than 2.3.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

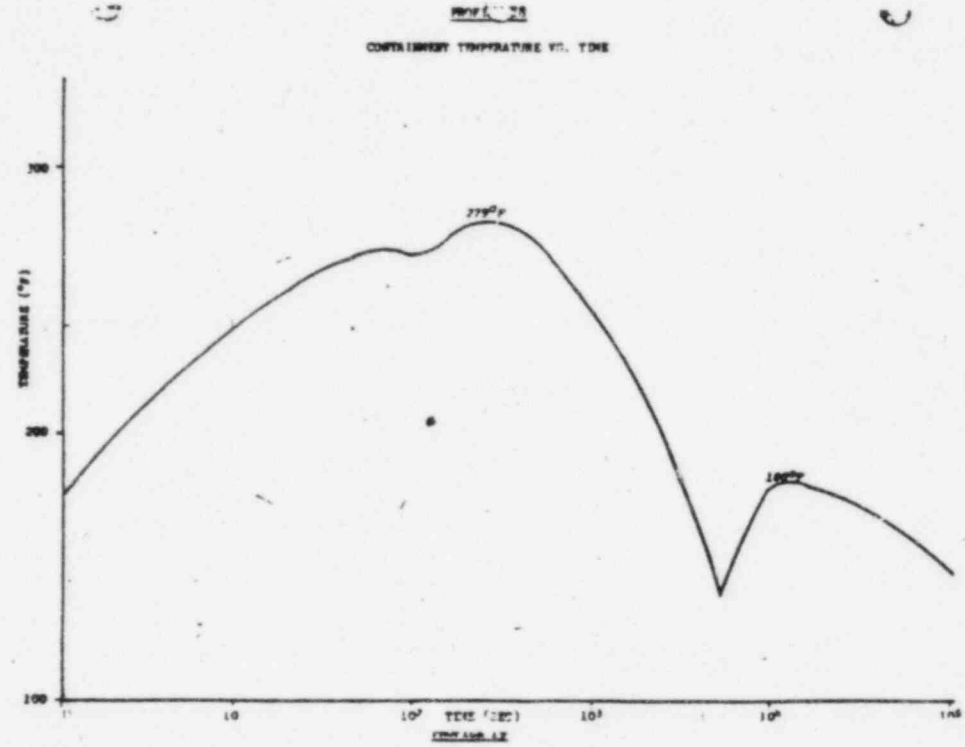
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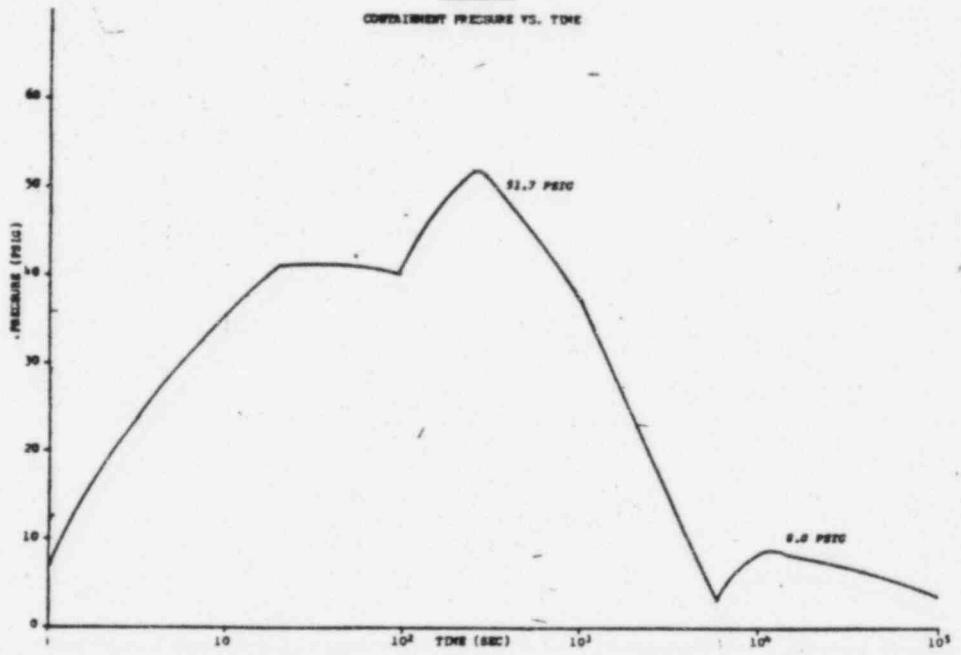
3. The licensee has provided a Wyle Labs Equipment Qualification Summary as evidence of qualification. The summary is for Namco EA180 limit switches. The licensee has provided a certificate of compliance for the EA740 which references the test report evaluated on pages 5a-5h.

4. The licensee has not provided the time period that the device is required to remain operable after being subject to a DBE.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

NOTES:



# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ITEM NO. 64
LIMIT SWITCH LOCATED IN THE CONTAINMENT
NAMCO MODEL EA740
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): VALVE CONTROL INTERLOCKS AND POSITION INDICATION (VARIOUS)
SERVICE: VARIOUS AIR OPERATED AND MOTOR OPERATED VALVES
LICENSEE SUBMITTAL: SCEW(S): 11-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, (QM), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, ~~5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (~~has~~/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | X |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I ___ ; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION | | | |
| Equipment Type | LIMIT SWITCH | Limit Switch | |
| Manufacturer's Name (5.2.2/-/-) | Namco | NAMCO Controls | |
| Model Number (5.2.2/-/-) | EA740 | EA-740 Series | |
| Serial Number | NOT STATED | EA-740-20000 | |
| Features/Mounting (5.2.6/-/-) | STEM MOUNTED ON VALVE | Horizontal in Autoclave | |
| Connections/Interfaces (5.2.6/-/-) | NOT STATED | Teflon Tape used to seal conduit threads | X See Note 1 |
| Location/Elevation | CONTAINMENT (-)14'-4" | Not Applicable | |
| Equipment ID No. | See 1a | Not Applicable | |
| QUALIFICATION REPORT (8.0/5.0/5.0) | | | |
| Report ID Number | [2116] | No Report I/D Number | NOTE 3 |
| Report Date | 10/13/80 | 2/20/78<br>2/22/79 (rev 1) | |
| Issued by | WYLE LABS | ACME CLEVELAND DEVELOPMENT COMPANY | |
| Prepared for | NUSCO | NAMCO CONTROLS | |
| Referenced Reports | No I/D No. | Not Stated | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | TEST | Sequential Test | |
| QUALIFICATION TEST PROGRAM | | | |
| Functional Test Description (5.2.5/2.2.9/2.2.9) | | Make/break contact | |
| Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq. | NOT STATED | 0.5Amps @ 100 Vdc | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Not Stated | |
| Accuracy (5.2.5/-/-) | | Not Stated | |
| Number of Specimens | | One (1) | |
| Test Instruments Calibrated | | Yes | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | ACTIVE | Active | |
| Test Duration (5.2.1/-/-) | | 30 days | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | NOT STATED | Not Applicable | |
| Required Function Time | NOT STATED | Not Applicable | NOTE 4 |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Inspection/Base line data<br>Heat/Humidity Aging | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | Mechanical Aging<br>Irradiation<br>Seismic testing<br>LOCA Simulation | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | ANALYSIS | 200 hours @ 200°F per ANSI draft std N278.2.1 | X Note 2 |
| Material Aging Evaluation (7.0/-/-) | ANALYSIS | Not Stated | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | YES | Not Stated | |
| Radiation Aging, Type | | Gamma | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | NOT STATED | 204 Megarads | * |
| Radiation Aging, Dose Rate | | 1.2 Megarads/ hour | |
| Radiation Aging, Method | | Test | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | NOT STATED | Not Stated | |
| Operational Aging (-/4.2/-) | | 100,000 Actuation Cycles | |
| Other Age Conditioning (-/4.2/-) | | Not Stated | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 2 YEARS BUNA-N GASKET | None Claimed | X NOTE 2 |
| Normal Ambient Temperature | 120°F | Not Applicable | |
| Normal Ambient Radiation | $5.1 \times 10^6$ RADS | Not Applicable | |
| Normal Ambient Humidity | NOT STATED | Not Applicable | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | NOT STATED | Not Applicable | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | NOT STATED | Not Applicable | |
| Margin (General) (6.0/3.0/3.0) | NOT STATED | Not Stated/ Not Appicable | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | Not Stated | |

* Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | LOCA | LOCA/MSLB | |
| Radiation Type | GAMMA | Gamma | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.9 \times 10^7$ RADS | 204 Megarads | * |
| Radiation Dose Rate (rd/hr) | NOT STATED | 1.2 Megarads per hour | |
| Radiation Qual. Method (5.3.1/-/-) | TEST | Test | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | NOT STATED | Not Applicable | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | NOT STATED | Not Stated | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $2.4 \times 10^7$ | Not Stated | |
| Plateout Dose Considered (-/1.48/1.48) | NOT STATED | Not Applicable | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | $1.5 \times 10^8$ RADS | Not Applicable | |

*Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | 6°F/3psi/sec | 11°F/8psi/sec | |
| Peak: °F/psig/RH/Time | 279/51.7/100/- | 340/115/100/3h4s | |
| Decrease To: °F/psig/RH/Time | See attached profile, page 5h | 140/-/-/2h4r<br>340/105/100/3hrs | |
| Decrease To: °F/psig/RH/Time | | 320/76/100/2hrs<br>300/57/100/1hr | |
| Decrease To: °F/psig/RH/Time | | 250/25/100/4days<br>150/10/100/25 days | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | NOT STATED | Not Applicable | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | TEST | Test | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 PPM Boron | Boric Acid/water/sodium thiosulfate/sodium hydroxide | |
| Spray Density (gpm/ft$^2$) | NOT STATED | 0.15 | |
| Spray Duration | NOT STATED | 30Days | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | NOT STATED | Not Applicable | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | NOT STATED | Not Applicable | |
| Time to Submergence | NOT STATED | Not Applicable | |
| Dust Environment (-/2.2.11/2.2.11) | — | Not Applicable | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

1. The report states " The switch was mounted in the chamber in a horizontal position such that the lever shaft pointed upwards. The switch was attached by means of a threaded pipe. Teflon tape was used for sealing the pipe threads.+

+No attempt is made to qualify the connection method. These test procedures are based on the assumption that the user will ensure that no steam enters the unit via this connection during an actual LOCA."

EL&

The licensee has not identified the connection method

2. The report states

"Heat aging. The heat aging test consisted of holding the unit suspended over water in a tank at a temperature of 200°F for 200 hours.+

+Heat aging conditions were taken from ANSI Draft Standard N278.2.1 (Draft 3, Rev. 0). The correlation between these conditions and the qualified life is not known.

The equipment qualification summary [2116] has evaluated the Buna-N gasket, Methyl vinyl Silicone rubber, and Silicone rubber gaskets with respect to loss of elongation in extrapolating the aging simulation to predict a qualified life. With respect to gaskets, the property of interest is compression set and the aging should be evaluated with respect to this property. In addition the extrapolation with respect to the Ethylene Propylene seems unreasonably high in using an activation energy of greater than 2.3.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

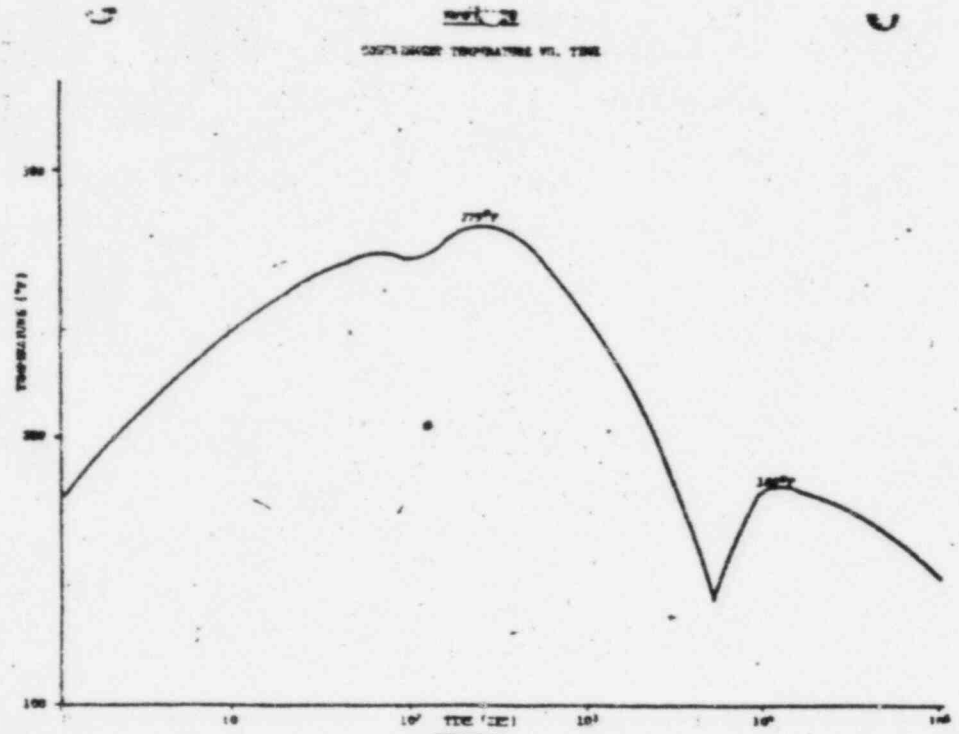
NOTES:

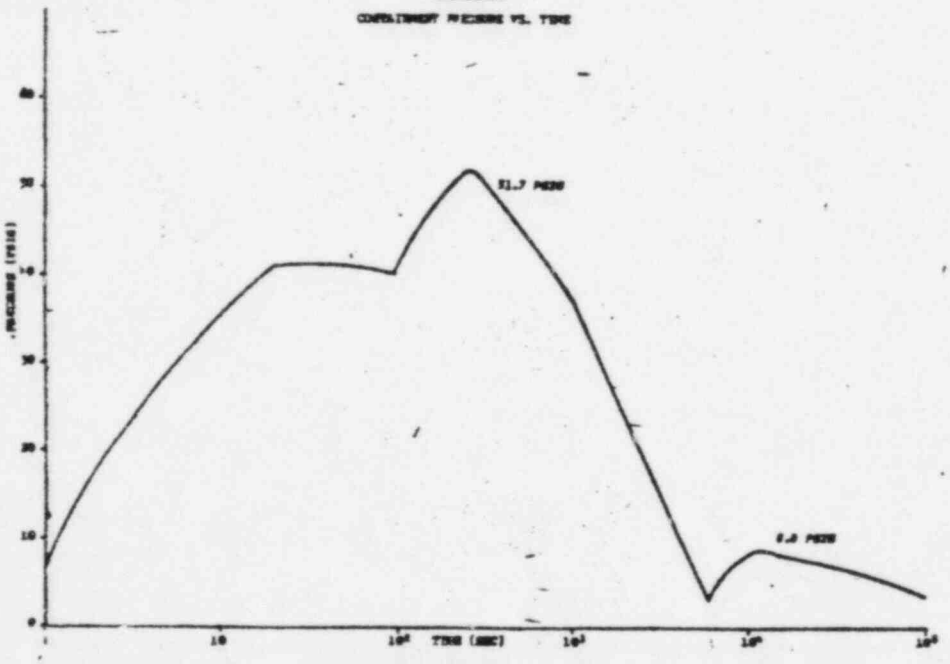
3. The licensee has provided a Wyle Labs Equipment Qualification Summary as evidence of qualification. The Summary is for Namco EA180 limit switches. The licensee has provided a certificate of compliance for the EA740 which references the test report evaluated on Pages 5a-5b.

4. The licensee has not provided the time period that the device is required to remain operable after being subjected to a DBE.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:





# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ITEM NO. 65
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A2
NAMCO MODEL EA74020100
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-6731)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 54-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

[X] The Licensee (has/~~has not~~) provided a response to the SER concerns.

[ ] The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

[ ] The Licensee has presented information which shows there are no outstanding qualification deficiencies.

[X] The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- [ ] Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- [X] Corrective action specified by the Licensee:
  - [ ] Equipment replacement with qualified equipment
  - [X] Equipment modification
  - [ ] Equipment relocation above submergence level
  - [ ] Relocate or shield equipment from radiation source
  - [ ] Verify qualification by additional (testing/analysis)
  - [ ] Equipment relocation to a mild environment
  - [ ] Qualification testing of equipment in progress
  - [ ] Other (_____)
- [ ] The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- [X] The Licensee (~~has not~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

[ ] The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation, refer to item no. 64

LICENSEE RESPONSE TO NRC SER

Response to TER concerns.

Conduit entering body of limit switch will be sealed to withstand more than the 0.5 pound differiential.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ITEM NO. 66
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17
NAMCO MODEL EA74020100
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-4246, 4248)
SERVICE: S/G BLOWDOWN ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 49-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-6050)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 55-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
X Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has not~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation, refer to item no 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

LICENSEE RESPONSE TO NRC SER

Response to TER concerns. (ZS-6050 ONLY)

Conduit entering body of limit switch will be sealed to withstand more than the 0.5 pound differiential.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ITEM NO. 67
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING PIPING PENETRATION ROOM, ZONE A-18
NAMCO MODEL EA18011302
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-2525)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 51-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-4250, ZS-4251)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 57-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
X Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | X |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

FOR EVALUATION, REFER TO ITEM NO. 63

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

LICENSEE RESPONSE TO NRC SER

Response to TER concerns. (ZS-2525)

Conduit entering body of limit switch will be sealed to withstand more than the 0.6 pound differiential.

Response to TER concerns. (ZS-4250, 4251)

Conduit entering body of limit switch will be sealed to withstand more than the 0.5 pound differiential.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ITEM NO. 68
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17, WEST PIPE PEN. RM
NAMCO MODEL SL3CB2
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION & CONTROL CIRCUITRY (ZS-9126)
SERVICE: WASTE GAS TANK INLET ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 69-B
FUNCTION (PLANT ID): VALVE POSITION INDICATION & CONTROL CIRCUITRY (ZS-7690)
SERVICE: REACTOR COOLANT SAMPLE VALVE
LICENSEE SUBMITTAL: SCEW(S): 69-BA
FUNCTION (PLANT ID): POSITION INDICATION VALVE CONTROL (ZS-6080, -6084, -6088, -6092)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 112-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-7311)
SERVICE: QUENCH TANK MAKEUP WATER CONTAINMENT ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 113-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-7312)
SERVICE: NITROGEN STOP VALVE TO SAFETY INJECTION TANKS
LICENSEE SUBMITTAL: SCEW(S): 116-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) QT, RT, (P) (H) CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a, 1a2 |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, 3c, 3d, 3e, 3f |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ITEM NO. 68 (CONTINUED)
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-9016)
SERVICE: PRIMARY DRAIN TANK DISCHARGE ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 119-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-505)
SERVICE: RCP BLEED OFF ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 120-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, 3c, 3d |
| System Consideration Review | 4a, 4b, 4c, 4d, 4e, 4f |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j |
| Installed TMI Lessons Learned Implementation Equipment Summary | 6a, 6b |
| Maintenance and Replacement Schedule Summary | 7a, 7b, 7c |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 81/231.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

ZS-7690,-9126

Response to SER concerns. (RPN, T, P, H, R, A, QI)

This equipment will be replaced with fully qualified devices.

ZS-6080,-6084,-6088,-6092,-7311,-7312,-9016,-505

Response to SER concerns. (RPN, R, QM, A)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCH ZD-9126
Ex-Containment Gas & Aerated Liquid Radwaste Containment Isolation Valve

**MANUFACTURER:** (NAMCO) - National Acme Corporation

**QUALIFICATION DISCREPANCY:** This equipment lacks documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** STEAM MOUNTED LIMIT SWITCHES ZS-7890
Gaseous & Aerated Liquid Radwaste Ex-Containment Isolation Valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. . Refer to Generic Replacement Schedule 1.

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCHES ZS-6080, 6084, 6088, 6092
Containment Air Recirculation Cooler Control Valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

LICENSEE RESPONSE TO NRC SER

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indicatio for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices Refer to Generic Replacement Schedule 1.

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCHES ZS-7311
Quench Tank Makeup Water Containment Isolation Valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valve that function to mitigate a LOCA. It is located outside the containment and is subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices Refer to Generic Replacement Schedule 1.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6E

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCHES ZS 7312
Nitrogen stop valve to safety injection tanks

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCHES ZS-9016
Primary drain tank isolation valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

**EQUIPMENT:** STEM MOUNTED LIMIT SWITCHES ZS-505

Reactor Coolant pump bleed off isolation valve

**MANUFACTURER:** National Acme Corporation (NAMCO)

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

This equipment provides contacts for control circuit input and position indication for containment isolation valves that function to mitigate a LOCA. They are all located outside the containment and are subject only to a radiation environment resulting from the LOCA. The control circuit operability requirement ceases within the first few seconds of the accident. Therefore, this equipment will receive an insignificant radiation dose prior to its required control operation.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

LICENSEE RESPONSE TO NRC SER

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ITEM NO. 69
ELECTRICAL CABLE LOCATED IN THE CONTAINMENT, ZONE C-5
ENDEVCO MODEL 3075M6
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS-200, -201, -402, -404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 18-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable
New Item

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed ~~a corrective~~ action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X ~~Corrective~~ action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action October 1981.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

LICENSEE RESPONSE TO NRC SER

Notes: a. This equipment is purchased on a risk release basis pending completion of vendor qualification testing and NUSCO review and acceptance of the final test reports. The target date for receipt of the final test report is 10-81. The qualification documentation references will be identified at that time.

b. The qualified life for this equipment will be determined in accordance with IEEE 323-1974 guidelines.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ITEM NO. 70
ELECTRICAL CABLE, INSTRUMENT LOCATED OUTSIDE CONTAINMENT
ROCKBESTOS MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): 1155
FUNCTION (PLANT ID): SIGNAL FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 5-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, ~~5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

LICENSEE RESPONSE TO NRC SER

Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

Notes:

3.* Insulation Only

1. Cable involves low current only. Continuous operation is inherent.
2. Environmental pressure is less than 2PSIG for about 13 sec. This is insignificant.

EQ JIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

The Licensee has not provided sufficient information to establish that the Installed and tested cables are the Same:

The test Report States:

TEST SAMPLE DESCRIPTIONS

Instrumentation Cable

Single Conductor #16 AWG, 300 volt , 20 mils of flame retardant XLPE insulation identified as Rockbestos Firewall® III.

*Control Cable

Single Conductor #12 AWG, 600 volt, 30 mils of flame retardant XLPE insulation identified as Rockbestos Firewall® III.

Power Cable

Single Conductor #6 AWG, 600 volt, 45 mils of flame retardant XLPE insulation identified as Rockbestos Firewall® III.

The SCEW Sheet states:

Component: Instrument Cable

Manufacture: Rockbestos Co. (Cerro)

Model Number: XLPE Insul-Neoprene Jacket

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

NOTES:



Table 1
Representative Cables for Type Tests

| Type | Test | Section | Size |
|---|---|---|---|
| Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see the below for individual component) or Single conductor power cable | temperature and moisture resistance | 2.3.1 | 1/C — 14 or 12 AWG |
| | thermal and radiation exposure | 2.3.3 | 1/C or M/C — 14 or 12 AWG |
| | design basis event simulation | 2.4 | 1/C or M/C — 14 or 12 AWG<br>1/C — 6, 4 or 2 AWG |
| | vertical flame test singles from cable assembly | 2.5.6 | 1/C — 14 or 12 AWG |
| | vertical tray flame test | 2.5.4 | 7/C — 16, 14 or 12 AWG |
| Shielded pairs, triple or quad from multiconductor signal cable | temperature and moisture resistance | 2.3.1 | 1 pair shielded 16 AWG or actual cable |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical flame test | 2.5.6 | |
| Coaxial, triaxial or special instrument cable | temperature and moisture resistance | 2.3.1 | actual size |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical flame test singles from cable assembly | 2.5.6 | |
| Single pair thermocouple extension cable | temperature and moisture resistance | 2.3.1 | 2/C — 20 AWG or actual size if smaller |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical tray flame test | 2.5.4 | |
| | vertical flame test singles from cable assembly | 2.5.6 | |
| 2001—15 000 V power cable 1/C triplexed and multiconductor | vertical tray flame test | 2.5.4 | 6 AWG (2-5kV)<br>2/O or 4/O or 4/O (2-15kV) |

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the manufacturer identifying what test report(s) apply to the cables furnished for installation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ITEM NO. 71
ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT
ROCKBESTOS MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): 1155
FUNCTION (PLANT ID): SIGNAL FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 6-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation see Item 70

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

1. Cable involves low current only. Continuous operation is inherent.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ITEM NO. 72
ELECTRICAL CABLE, COAXIAL LOCATED IN THE CONTAINMENT
ROCKBESTOS MODEL RSS6104
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 72
LICENSEE REFERENCE(S): 3247, 52
FUNCTION (PLANT ID): RADIATION MONITORING CABLING (Z1RM8240/B, C - Z2RM8241/B, C)
SERVICE: LOW LEVEL SIGNAL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 37-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (~~has~~/has not) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (~~has~~/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | X |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

The Anomaly mentioned by the Licensee on page 3a was identified by the Radiation Monitor manufacturer and involves the inability of the Cable to transmit the signal when subjected to LOCA test Conditions.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

Vendor has advised of an anomaly in temperature qualification which may affect this equipment. An investigation is presently in progress to determine applicability and effect on this equipment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ITEM NO. 73
ELECTRICAL CABLE, COAXIAL LOCATED OUTSIDE CONTAINMENT
ROCKBESTOS MODEL RSS6104
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 73
LICENSEE REFERENCE(S): 3247
FUNCTION (PLANT ID): RADIATION MONITORING CABLE (Z1RM8240/B, C - Z2RM8241/B, C)
SERVICE: LOW LEVEL SIGNAL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 122-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | X |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation see Item 72.

However, The licensee should determine whether this equipment is required to function for the HELB accident

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

Notes: 1. The pressure is less than 2PSIG for about 13 seconds. This is considered insignificant.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ITEM NO. 74
ELECTRICAL CABLE, POWER LOCATED OUTSIDE CONTAINMENT
GENERAL CABLE MODEL EPR/HYPALON
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 74
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): WIREWAYS FOR MEDIUM VOLTAGE MOTORS & POWER SOURCES
SERVICE: 4160 V SYSTEMS
LICENSEE SUBMITTAL: SCEW(S): 2-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
(IV Documentation Not Available)

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | ____ |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | X |

The licensee references a General Cable report and a Wyle report which were not available for review. Note 1 on Scenshet (reproduced on p-30) is ambiguous regarding the need for qualification.

LICENSEE RESPONSE TO NRC SER

Response to SER concerns.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

1) No Safety Related 5000 V Cable in Areas Outside Containment Subject to High Temperature, i.e. 261°F or Higher

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ITEM NO. 75
ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT
KERITE MODEL 600V
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 6-AA

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, ~~5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

NOTES: This equipment was previously evalusted for NNECO on Millstone Unit 1 in TER C5257-459 which stated:



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

Equipment Item No. 93
Electrical Cable Located in the Drywell
Kerite HTK/FR
Electrical Distribution
Licensee References 29, 819, and 820
Required Operating Time: Continuous
TER Checksheet No. 93
Reference 19, Section 4.5.2.7
Licensee Submittal: Page IV-2 [22]



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

This equipment item was previously evaluated in Reference 19. See page 1A Equipment Item description.

The Licensee has resolved previously identified deficiencies - see p-3a
Review of Reference 29 confirms Licensee statements

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ITEM NO. 76
ELECTRICAL CABLE, INSTRUMENT LOCATED OUTSIDE CONTAINMENT
KERITE MODEL 600V
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 5-BA

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| (I.a Qualified) | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation and response refer to Item 75.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

LICENSEE RESPONSE TO NRC SER

- Environmental pressure is less than 2 PSIG for about 13 seconds. This is insignificant.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ITEM NO. 77
ELECTRICAL CABLE, CONTROL LOCATED OUTSIDE CONTAINMENT
KERITE MODEL FR/FR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 77
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR CONTROL AND LOW LEVEL POWER CIRCUITS
SERVICE: VARIOUS CONTROL AND LOW LEVEL POWER CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 3-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, ~~5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

Franklin Research Center
A Division of The Franklin Institute
20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 467

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5c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

NOTES: This equipment was previously evaluated for NNECO for Millstone Unit

in TER C5257-459 which stated:

Franklin Research Center
A Division of The Franklin Institute
20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 459

Page
1a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

Equipment Item No. 92
Electrical Cable Located in the Drywell
Kerite FR/FR
Electrical Distribution
Licensee References 29, 819, and 820
Required Operating Time: Continuous
TER Checksheet No. 92
Reference 19, Section 4.5.2.7
Licensee Submittal: Pages IV-1, -3, -4, -5, -6, -8 [22]

Franklin Research Center
A Division of The Franklin Institute
20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 459

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2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Not Satisfied | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

This equipment item was previously evaluated in Reference 19. See page 1A Equipment Item description.

Previously identified deficiencies were resolved by the Licensee. See page 3a.

Review of Reference 29 confirms Licensee Statement.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ITEM NO. 78
ELECTRICAL CABLE, CONTROL LOCATED IN THE CONTAINMENT
KERITE MODEL FR/FR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 78
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR CONTROL & LOW LEVEL POWER CIRCUITS
SERVICE: VARIOUS CONTROL AND LOW LEVEL POWER CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 5-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For evaluation refer to Item 77

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ITEM NO. 79
ELECTRICAL CABLE, POWER LOCATED IN THE CONTAINMENT
ANACONDA WIRE AND CABLE MODEL EPR/CSPE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 79
LICENSEE REFERENCE(S): 1347
FUNCTION (PLANT ID): WIREWAYS FOR LOW VOLTAGE MOTORS, D.C. SYSTEMS, HEATER, ETC.
SERVICE: 480V, 120 VAC, 125 VDC CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 4-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, ~~5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (nas/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~nas not~~) specifically stated that the equipment is qualified and~~/or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

The Licensee has not provided sufficient information to establish that the Installed and tested cables are the Same:

The test Report States:

2. TEST SPECIMENS

A description of the cable specimens is presented below. The descriptions were provided by The Anaconda Company. Table 1 lists the cable specimens tested and shows their energizing voltage and current levels.

A. Low Voltage Power Cable (Durasheath ® EP)*
Specimens: 18.11, 18.12
1/C, No. 12 AWG 7/W Tinned Copper Conductor, 30 mil Ethylene Propylene Rubber Insulation, 15 mil Chlorosulfonated Polyethylene Jacket

B. Control Cable (Flameguard ® EP)*
Specimen: 20.11
7/C No. 12 AWG 7/W Tinned Copper Conductor, 30 mil Ethylene Propylene Rubber Insulation, 15 mil Chlorosulfonated Polyethylene Jacket, Cabled, Asbestos Tape, 60 mil Chlorosulfonated Polyethylene Overall Jacket

C. Medium Voltage Power Cable (Uniblend ® EP)*
Specimen: 19.21
1/C No. 2 AWG 7/W Copper Conductor, Extruded Semi-Conducting Strand Shield, 90 mil Ethylene Propylene Rubber Insulation, 30 mil Extruded Semi-Conducting Chlorosulfonated Polyethylene Insulation Shield, Copper Tape, 60 mil Chlorosulfonated Polyethylene Jacket

D. Medium Voltage Power Cable (Unishield ® EP)*
Specimen: 19.11
1/C No. 2 AWG 7/W Copper Conductor, Extruded Semi-Conducting Strand Shield, 90 mil Ethylene Propylene Rubber Insulation, Six Corrugated Copper Drain Wires Embedded in a 75 mil Semi-Conducting Chlorinated Polyethylene Jacket

The SCEW Sheet states:

Component: Low Voltage
Power Cable

Manufacture: Anaconda

Model Number: EPR Insul,
CSPE Jacket
Function: Wirewyas for
Low Voltage Motors,
D.C. Systems, Heater, etc.

If Similarity Can be established the test report adequately demonstrates that the Cable installed at millstone 2 is qualified.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

NOTES:



Table 1
Representative Cables for Type Tests

| Type | Test | Section | Size |
|---|---|---|---|
| Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or Single conductor power cable | temperature and moisture resistance | 2.3.1 | 1/C — 14 or 12 AWG |
| | thermal and radiation exposure | 2.3.3 | 1/C or M/C — 14 or 12 AWG |
| | design basis event simulation | 2.4 | 1/C or M/C — 14 or 12 AWG<br>1/C — 6, 4 or 2 AWG |
| | vertical flame test singles from cable assembly | 2.5.6 | 1/C — 14 or 12 AWG |
| | vertical tray flame test | 2.5.4 | 7/C — 16, 14 or 12 AWG |
| Shielded pairs, triple or quad from multiconductor signal cable | temperature and moisture resistance | 2.3.1 | 1 pair shielded 16 AWG or actual cable |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical flame test | 2.5.6 | |
| Coaxial, triaxial or special instrument cable | temperature and moisture resistance | 2.3.1 | actual size |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical flame test singles from cable assembly | 2.5.6 | |
| Single pair thermocouple extension cable | temperature and moisture resistance | 2.3.1 | 2/C — 20 AWG or actual size if smaller |
| | thermal and radiation exposure | 2.3.3 | |
| | design basis event simulation | 2.4 | |
| | vertical tray flame test | 2.5.4 | |
| | vertical flame test singles from cable assembly | 2.5.6 | |
| 2001–15 000 V power cable 1/C triplexed and multiconductor | vertical tray flame test | 2.5.4 | 6 AWG (2·5kV) 2/O or 4/O or 4/O (2·15kV) |

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the manufacturer identifying what test report(s) apply to the cables furnished for installation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ITEM NO. 80
ELECTRICAL CABLE, POWER LOCATED OUTSIDE CONTAINMENT
ANACONDA WIRE AND CABLE MODEL EPR/CSPE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): 1347
FUNCTION (PLANT ID): WIREWAYS FOR LOW VOLTAGE MOTORS, D.C. SYSTEMS, HEATERS, ETC.
SERVICE: 480 V, 120 VAC, 125 VDC CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 4-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82)

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

For Evaluation refer to Item 79 Pages 5a, 5b, 5c.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

Notes: 1. Environmental pressure is less than 2PSIG for about 13 sec. This is insignificant.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ITEM NO. 81
ELECTRICAL TERMINATION LOCATED IN THE CONTAINMENT, ZONE C-5
ROSEMOUNT MODEL 104ADA (TE112HC104AFC1)
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 81
LICENSEE REFERENCE(S): 32
FUNCTION (PLANT ID): RCS LOOP TEMPERATURE RTD CABLE TERMINATION (TE112HA-D, TE1122HA-D, TE112CA-D, TE122CA-D)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 5-C

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), QT, RT, (P), (H), CS, A, S, (R), M, I, (QM), (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment ~~is qualified and/or~~ will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 12/81.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| (I.b Modification) | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | X |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

LICENSEE RESPONSE TO NRC SER

Response to SER concerns. (RPN, T, P, H, R, QM,)

This equipment will be replaced with fully qualified devices.

**EQUIPMENT:** RCS loop temperature RTD connection heads
TE-112CA-CD TE-112HA-HD
TE-122CA-CD TE-122HA-HD

**MANUFACTURER:** Rosemount

**QUALIFICATION DISCREPANCY:** These components lack documented qualification data.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

These components provide protection for the cable terminations of the referenced RTD's. These RTD's provide control room indication of the monitored parameters and RPS input for the thermal margin/low pressure trip setpoint determinations.

Reasonable assurance that these components will provide the required protection is provided by Reference 1 on system component evaluation work sheet.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices Refer to Generic Replacement Schedule 1.

GENERIC REPLACEMENT SCHEDULES

No. 1 The replacement of this group of equipment is scheduled to commence with the next refueling outage which is currently scheduled to commence in December 1981. In the event that the replacement schedule is subsequently modified, the Staff will be notified of the revised schedule in subsequent correspondence.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ITEM NO. 82
TERMINAL BLOCK LOCATED IN THE CONTAINMENT
WEIDMULLER MODEL TYPE SAK4
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): 3644, 3510
FUNCTION (PLANT ID): TERMINATION OF MONITORING CIRCUITS (T356, T357)
SERVICE: CONTAINMENT SUMP LEVEL MONITORS
LICENSEE SUBMITTAL: SCEW(S): 38-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable
New Item

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, ~~5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and~~/or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| (I.a Qualified) | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

NOTES: The Licensee provided test documentation which establishes qualification for the Weidmuller Terminal blocks. The Test Documentation states:

F-C5205-3

Table 1. Identification of Test Specimens

| Weidmuller Terminal Type[1,2] | Barriers[2] Installed | Specimen No. | Test Group[3] |
|---|---|---|---|
| SAK 4 | TW | C5205-O | II |
| SAK 6N | TW | C5205-F | I |
| SAK 6N | None | C5205-B | I |
| SAK 10 | TW | C5205-G | II |
| SAK 10 | None | C5205-A | II |

NOTES

1 All specimens were glass-filled phenolic terminal blocks.

2 Terminal and barrier type designations provided by client.

3 Specimens separated into test groups I and II. Each group subjected to separate SLB/LOCA exposures.

## 4. TEST PROGRAM

The test program was designed to simulate a combined (SLB/LOCA). The program included thermal aging, gamma irradiation, vibration aging, seismic testing, a 29-h simulated SLB/LOCA exposure and a final insulation resistance measurement. The rationale for this test sequence is provided as Appendix B.

### 4.1 PRETEST PREPARATIONS

The specimens were inspected and identified in accordance with information contained in Table 1. Short lengths of connecting wires had been previously installed by the client. See Figure 1.

### 4.2 THERMAL AGING

The specimens were placed in a forced-circulation air oven and thermally aged at 140°C (284°F) for 7 days (168 h). See Figure 2.

### 4.3 GAMMA IRRADIATION

The specimens were exposed to an air-equivalent dose of 200 Mrd minimum of gamma irradiation from a cobalt-60 source at an average dose rate of 0.62 Mrd/h.

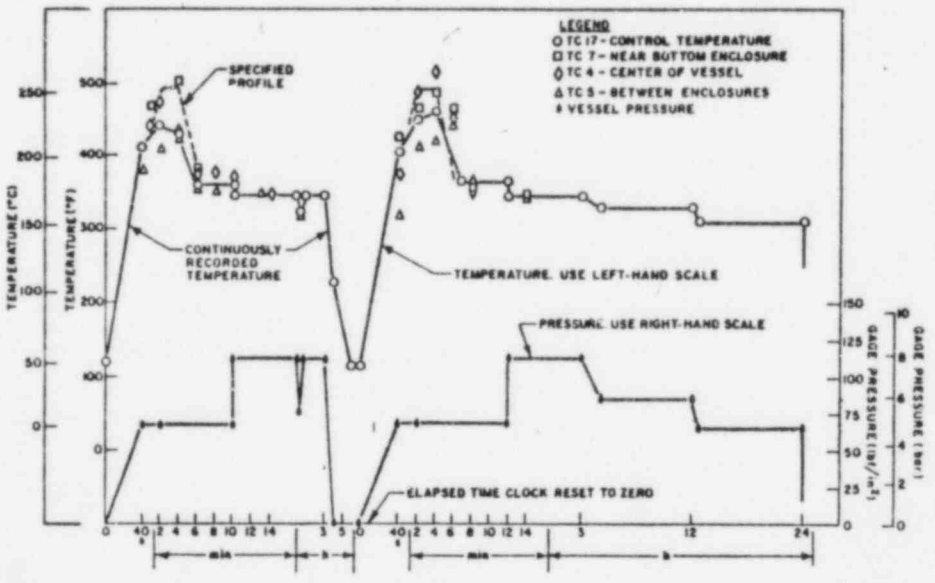
F-C5205-3

4.6.3 Insulation Resistance Measurements

The insulation resistance (IR) of the specimens was measured at a dc potential of 500 volts, held for one minute. The IR measurements were made just before and just after the S/C exposure. IR measurements included the IR of the Kapton wires and other extension wires used to connect the specimens to the electrical circuits.

4.7 FAILURE CRITERION

The pass/fail criterion was based on the ability of the specimen to maintain the 600-V potential and 20-A current during the SLB/LOCA exposure, without excessive leakage/charging current. If a leakage/charging current exceeding 1.0 A developed in the potential supply circuit during the steam/chemical-spray exposure, a circuit breaker tripped and removed the applied voltage. The faulting specimen or the source of the excessive leakage/charging current was then isolated and the remaining specimens were replaced in the energizing circuit.




F-C5205-3

Figure 10. Temperature and Pressure Profile for S/C Exposure of Group I Specimens

| WEIDMÜLLER TERMINAL BLOCK TYPE | END BARRIER | TERMINAL BLOCK | TEST GROUP | TERMINAL NOS.[1] | PRE-LOCA RESISTANCE[2] (ohms) | POST-LOCA RESISTANCE[2] (ohms) |
|---|---|---|---|---|---|---|
| SAK 4 | TW | O | II | 1,3 and 5 | $1.3 \times 10^{10}$ | $4.5 \times 10^{7}$ |
| | | | | 2 and 4 | $1.5 \times 10^{10}$ | $6.6 \times 10^{7}$ (erratic) |
| SAK 6N | TW | F | I | 1,3 and 5 | $1.0 \times 10^{8}$ | $4.0 \times 10^{7}$ |
| | | | | 2 and 4 | $1.6 \times 10^{8}$ | $4.5 \times 10^{7}$ |
| SAK 6N | None | B | I | 1,3 and 5 | $1.0 \times 10^{8}$ | $6.0 \times 10^{7}$ |
| | | | | 2 and 4 | $1.2 \times 10^{8}$ | $8.4 \times 10^{7}$ |
| SAK 10 | TW | G | II | 1,3 and 5 | $1.4 \times 10^{10}$ | $3.5 \times 10^{8}$ |
| | | | | 2 and 4 | $1.6 \times 10^{10}$ | $2.4 \times 10^{7}$ (erratic) |
| SAK 10 | None | A | II | 1,3 and 5 | $1.3 \times 10^{10}$ | $1.1 \times 10^{8}$ (erratic) |
| | | | | 2 and 4 | $1.5 \times 10^{10}$ | $5.2 \times 10^{7}$ |

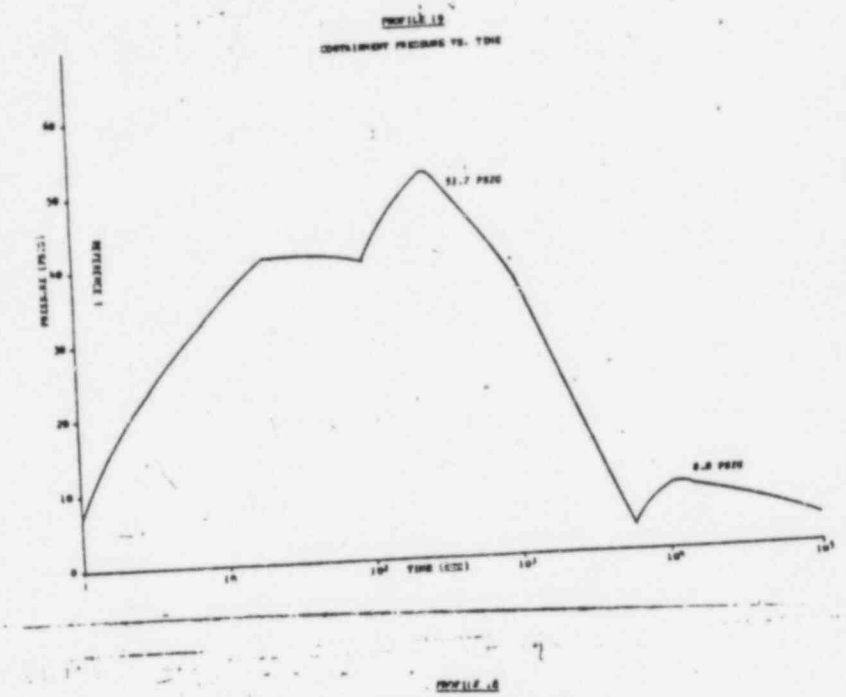
[1] IR measurements made between terminals indicated connected together and all other terminals connected together at ground potential.

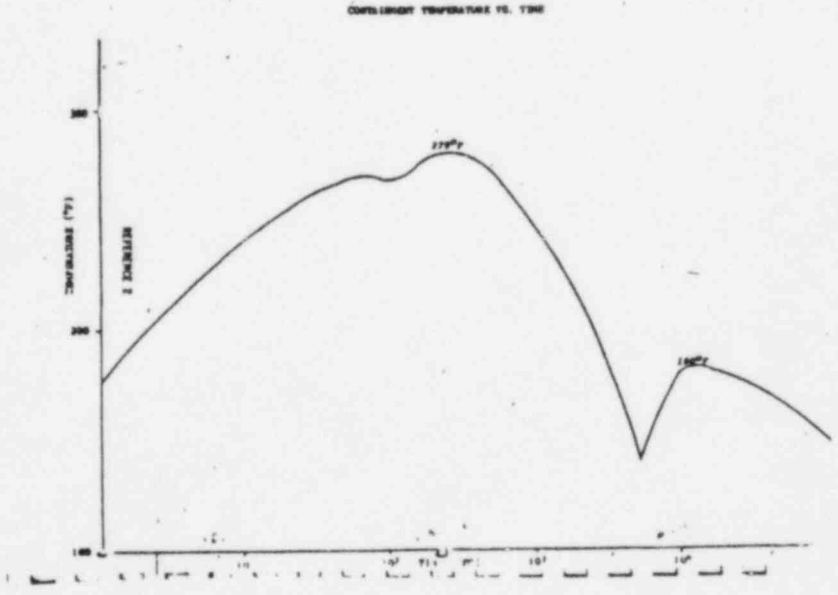
[2] IR measurements made at 500 volts dc held for 1 min.

Table 3. Summary of Insulation Resistance Measurements

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES: The Required profiles are:





# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ITEM NO. 83
TERMINAL BLOCK LOCATED IN THE CONTAINMENT, ELEV. 14'6"
GENERAL ELECTRIC MODEL CR151
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): 3632, 12, 14
FUNCTION (PLANT ID): TO TERMINATE CONNECTIONS TO ELECTRICAL PENETRATIONS
SERVICE: VARIOUS CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 3-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, (EXN) SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, ~~5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| (I.a Qualified) | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

Aging analysis utilizing Arrhenius Methodology completes qualification.

II) Response to SER concerns. (A)

Aging is addressed above and in the body of the Submittal.

III) Response to TER concerns.

Same as II.

IV) Proposed corrective action and schedule.

Refer to description of plant surveillance and preventive maintenance program in body of submittal.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

NOTES: The licensee provided test documentation which stated the following:

4.2 Description of Test

Two adjacent terminals of each terminal block were connected to an IR rack with #16AWG wire passing through two sealed ports in the pressure vessel. (See Test Circuit Diagram).

The insulation resistance was measured between the 2 terminals with 500 vdc power supply at ambient condition. The terminal blocks were then subjected to the LOCA condition as shown in Table 1. The insulation resistance was recorded at least once a day and at each significant temperature condition during the test. After completion of the 10 day test the cover was removed and the vessel was left open for 36 hours before final insulation resistance measurements were recorded. See Test Data Sheet for specific values.

TABLE 1

| | | | | | |
|---|---|---|---|---|---|
| TEMPERATURE °F | 260 | 320 | 340 | 320 | 260 |
| PRESSURE PSIG | 21 | 75 | 103 | 75 | 21 |
| RELATIVE HUMIDITY % | 100 | 100 | 100 | 100 | 100 |
| DURATION | 1.5 days | 1.5 hrs | 3 hrs | 4.5 hrs | 8 days |

4.3 Test Equipment

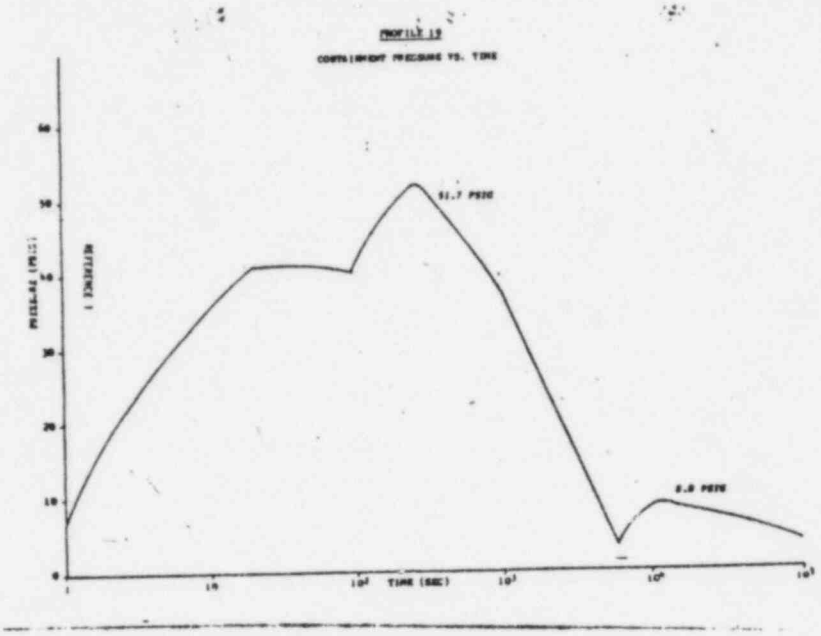
Pressure Vessel
IR Rack
Chromel Alumel temperature probe
Temperature Controller
G.E. Terminal Block CR 151 B
States Co. Terminal Block-type M.T.

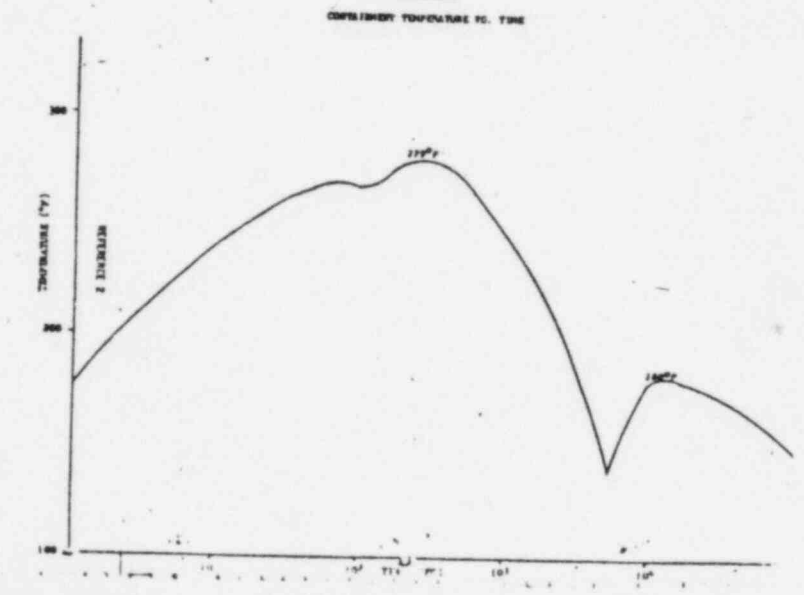
N.L. 10/17/75 entry to Complete

TERMINAL BLOCK
TEST DATA SHEET

| DATE | TIME | TEMP °F | PRESSURE PSIG | INSULATION RESISTANCE OHMS G.E. | STATES |
|---|---|---|---|---|---|
| 10-10 | Pretest | 70° | 0 | $>10^{10}$ | $>10^{10}$ |
| 10-10 | @20:15 hr | 260° | 21 | Start Test | |
| 10-11 | @08:10 hr | 260° | 21 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-12 | @09:30 hr | 320° | 75 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-12 | @11.04 hr | 340° | 103 | $2.2\times10^{4}$ | $2.6\times10^{4}$ |
| 10-12 | @14:04 hr | 340° | 102 | $1.9\times10^{4}$ | $2.4\times10^{4}$ |
| 10-12 | @15.10 hr | 320° | 75 | $1.9\times10^{4}$ | $2.4\times10^{4}$ |
| 10-12 | @18:30 hr | 320° | 75 | $1.9\times10^{4}$ | $2.4\times10^{4}$ |
| 10-13 | @07:00 hr | 260° | 22 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-14 | @08:00 hr | 260° | 21 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-15 | @08:00 hr | 260° | 22 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-16 | @08:00 hr | 260° | 22 | $2.4\times10^{4}$ | $2.5\times10^{4}$ |
| 10-17 | @08:00 hr | 260° | 22 | $2.2\times10^{4}$ | $2.4\times10^{4}$ |
| 10-18 | @08:00 hr | 260° | 21 | $2.4\times10^{4}$ | $2.5\times10^{4}$ |
| 10-19 | @08:00 hr | 260° | 22 | $2.4\times10^{4}$ | $2.5\times10^{4}$ |
| 10-20 | @20:15 hr | 260° | 22 | End Test | |
| 10-22 | Post Test | 70°F | 0 | $3.5\times10^{9}$ | $4.4\times10^{9}$ |

NOTES: The Required profiles are:




Regarding Spray the licensee states:

Notes: 1. Term. blocks are mounted in sealed boxes. No direct impingement. Protection considered adequate to prevent failure due to an accident.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ITEM NO. 84
TERMINAL BLOCK LOCATED IN THE ENCLOSURE BUILDING, ELEV. 14'6", ZONE A25, A26
GENERAL ELECTRIC MODEL CR151
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 84
LICENSEE REFERENCE(S): 3632, 12, 14
FUNCTION (PLANT ID): TO TERMINATE CONNECTIONS TO ELECTRICAL PENETRATIONS
SERVICE: VARIOUS
LICENSEE SUBMITTAL: SCEW(S): 1-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | ~~3a, 3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | ____ |

For response & evaluation, refer to item 83

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ITEM NO. 85
ELECTRICAL PENETRATION LOCATED IN THE CONTAINMENT, ELEV. 14'6"
CONAX MODEL 785210000
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 85
LICENSEE REFERENCE(S): 3509
FUNCTION (PLANT ID): MAINTAIN ELECTRICAL CONTINUITY THROUGH THE CONT. STRUCTURE (ED3, ED8, ED9, WD3, WD8, WD9)
SERVICE: VARIOUS INSTRUMENTATION CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 36A
FUNCTION (PLANT ID): MAINTAIN ELECTRICAL CONTINUITY THROUGH THE CONT. STRUCTURE (EB2, WB2, EB4, EC1, EC3, WC3, WC5)
SERVICE: VARIOUS LOW VOLTAGE POWER & CONTROL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 2-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, ~~5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | ____ |
| Adequate Similarity Between Equipment and Test Specimen Established | ____ |
| Aging Degradation Evaluated Adequately | ____ |
| Qualified Life or Replacement Schedule Established (If Required) | ____ |
| Program Established to Identify Aging Degradation | ____ |
| Criteria Regarding Aging Simulation Satisfied (If Required) | ____ |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | ____ |
| o Peak Pressure Adequate | ____ |
| o Duration Adequate | ____ |
| o Required Profile Enveloped Adequately | ____ |
| o Steam Exposure (If Required) Adequate | ____ |
| Criteria Regarding Spray Satisfied | ____ |
| Criteria Regarding Submergence Satisfied | ____ |
| Criteria Regarding Radiation Satisfied | ____ |
| Criteria Regarding Test Sequence Satisfied | ____ |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | ____ |
| Criteria Regarding Functional Testing Satisfied | ____ |
| Criteria Regarding Instrument Accuracy Satisfied | ____ |
| Test Duration Margin (1 hour + Function Time) Satisfied | ____ |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | ____ |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | ____ |
| II.a | Equipment Qualification Not Established | ____ |
| II.b | Equipment Not Qualified | ____ |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | ____ |
| III.a | Equipment Exempt From Qualification | ____ |
| III.b | Equipment Not in the Scope of the Qualification Review | ____ |
| IV | Documentation Not Made Available | ____ |

LICENSEE RESPONSE TO NRC SER

Response to SER concerns.(A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

Response to TER concerns.

Qualified life is greater than or equal to the plant design life. The above referenced surveillance program will periodically verify the aging analysis.

NOTES: The Licensee provided test documentation whcih established qualificaitic and Stated:

CONAX CORPORATION
2300 WALDEN AVENUE
BUFFALO, NEW YORK 14225

NUCLEAR PRODUCTS DIVISION

NUCLEAR

No. [illegible]

| REV. | DATE |
|---|---|
| | |

GEN/TR CONAX PS552

PROPRIETARY

3491

DESIGN QUALIFICATION REPORT

FOR

LOW VOLTAGE POWER

ADAPTER MODULES

FOR

MILLSTONE NUCLEAR POWER STATION - UNIT 2

FOR

NORTHEAST UTILITIES SERVICE COMPANY

CONAX W/O 7-85200

PROPRIETARY-CONAX CORP.

JUN 25 1980

PREPARED BY W C Federick DATE 6/23/80
W.C. FEDERICK - Project Engineer

APPROVED BY E J Illig DATE 6/24/80
E.J. ILLIG - Project Manager, Test

G.M. Rhodes DATE 6/25/80
G.M. RHODES - Manager of Engineering

DATE

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

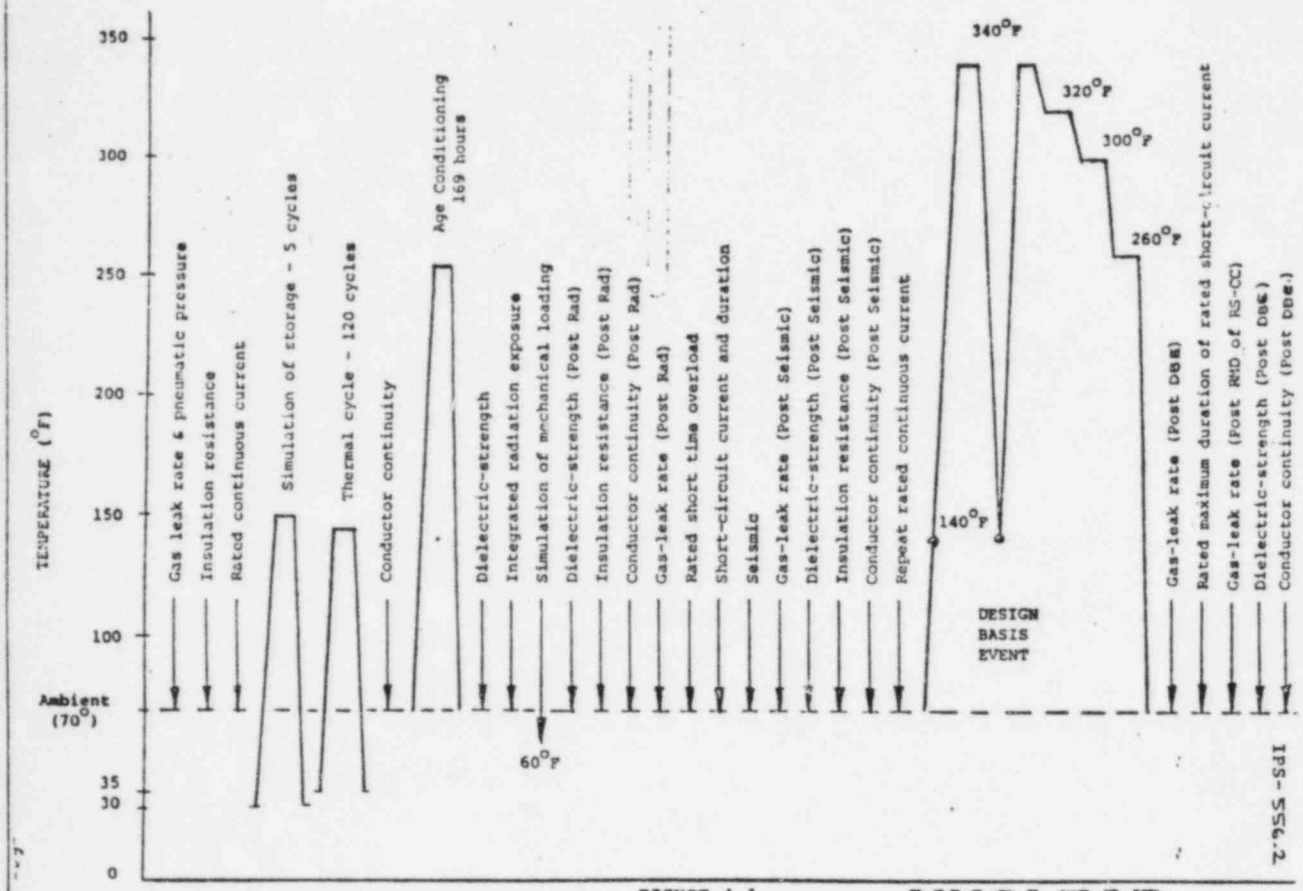



FIGURE 4.1
TEST PROGRAM PROFILE

NUCLEAR

4. Age Conditioning Test

Test Data Base One was age conditioned at a constant temperature of 124°C (255°F) for 169 hours. Age conditioning of the penetration was performed in lieu of a Thermal Aging Test based on evidence presented in IPS-325 (Ref. 2.6) which addresses thermal aging simulating normal service conditions for Conax penetrations. Justification for this aging time and temperature is given in Section 5.6.2.3 of this report.

5. Irradiation

Test Data Base One was subjected to a gamma irradiation level of $2.238 \times 10^8$ rads with a dosage rate of $2.04 \times 10^6$ rads per hour for a period of 109.7 hours.

5.6.1.1 After irradiation, Test Data Base One was visually inspected and, for evaluation purposes, tested for leakage, dielectric strength, insulation resistance, and conductor continuity and met or exceeded the values given in Table 5.6.1. All test results were satisfactory and no observable deficiencies were detected.

TABLE 5.6.1

POST IRRADIATION TEST MEASUREMENTS

| | |
|---|---|
| Leak Rate: He* @ 80 psig and room temp. | $1.55 \times 10^{-9}$ scc/sec |
| Dielectric Strength**: 1 minute (min) | 1.96 KVAC*** |
| Insulation Resistance**: observed min. @ 500 VDC | $4.8 \times 10^9$ ohms (12 gage) |
| | $4.2 \times 10^9$ ohms (16 gage) |
| Conductor Continuity: | Verified |

* Helium utilized as a more stringent requirement.
** Between conductor and ground and between conductor and all other conductors.
*** 1.1 times higher than 1.76 KVAC as required by IEEE 317-76, (Para 6.4.8)

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ITEM NO. 86
HYDROGEN RECOMBINER LOCATED IN THE CONTAINMENT, ELEV. 14'6" (H-29A), ELEV. 38'6" (H-29B)
WESTINGHOUSE, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 86
LICENSEE REFERENCE(S): 1571 THROUGH 1578, 15
FUNCTION (PLANT ID): TO LIMIT HYDROGEN EXISTING IN THE CONTAINMENT (H-29A, H-29B)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 7-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, (None,)

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h~~, 5i, 5j |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | X |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. E6

LICENSEE RESPONSE TO NRC SER

Response to TER concerns.

SCEW 7-A reference 4. is provided by Westinghouse as applicable to the Millstone Unit 2 Hydrogen Recombiner.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I ___ ; NUREG-0588, Cat. II ___ .

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION | | | |
| Equipment Type | Hydrogen Recombiner | Electrical Hydrogen Recombiner | |
| Manufacturer's Name (5.2.2/-/-) | Westinghouse | Westinghouse | |
| Model Number (5.2.2/-/-) | Not Stated | Model A | |
| Serial Number | | | |
| Features/Mounting (5.2.6/-/-) | Standard | standard | |
| Connections/Interfaces (5.2.6/-/-) | | Junction boxes, cables, thermocouples, etc. | |
| Location/Elevation | Containment | | |
| Equipment ID No. | See page 1a | | |
| QUALIFICATION REPORT (8.0/5.0/5.0) | | | |
| Report ID Number | See licensee references, page 1a. | WCAP-7709-L & Supplements 1 thru 7 | [1571] thru [1578] |
| Report Date | | | |
| Issued by | | Westinghouse | |
| Prepared for | | AEC/DRL | |
| Referenced Reports | | | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | Test | Type Test | |
| QUALIFICATION TEST PROGRAM | | | |
| Functional Test Description (5.2.5/2.2.9/2.2.9) | | Series of tests demonstrating heater operability under DBE condrtions. | |
| Operating Conditions (-/2.2.10/2.2.10) | | | |
| Load/Cycles/Voltage/ Current/Freq. | | | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | | Must pass visual inspection & functional test | |
| Accuracy (5.2.5/-/-) | Not Required | N/A | |
| Number of Specimens | | | |
| Test Instruments Calibrated | | | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Active | | |
| Test Duration (5.2.1/-/-) | | 5½ days to 12 months, depending on test | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | 3 hours | | |
| Required Function Time | Continuously | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Inspection / Baseline / Thermal Aging / Radiation / Mechanical stress / DBE / Post DBE / Inspection | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | | 80 thermal cycles / 40 cycles normal in 40 yrs. | |
| Material Aging Evaluation (7.0/-/-) | | | See Note 1, page 5f |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | | | |
| Radiation Aging, Type | | Not stated | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | | $2 \times 10^8$ Rad | |
| Radiation Aging, Dose Rate | | $3.3 \times 10^5$ Rad/hr | |
| Radiation Aging, Method | | Irradiation chamber | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | | Power cables | |
| Operational Aging (-/4.2/-) | | | |
| Other Age Conditioning (-/4.2/-) | | | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 40 years | 40 yrs./40 yrs. | See Note 1, Page 5f |
| Normal Ambient Temperature<br>Normal Ambient Radiation<br>Normal Ambient Humidity | | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | | |
| Margin (General) (6.0/3.0/3.0) | | Meets 4.0 & 5.2 of DOR guidelines. | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | LOCA | LOCA | |
| Radiation Type | | Not stated | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | | See Radiation Aging, page 5c. | |
| Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-) | | | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | | N/A, with analysis | |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $1.5 \times 10^8$ R | | |
| Plateout Dose Considered (-/1.48/1.48) | | | |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | N/A, with analysis (i.e. same as gamma dose) | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS | | | |
| Rate of Temp./Press. Increase | See pages 5i & 5j | See profiles, pages 5i & 5j | |
| Peak: °F/psig/RH/Time | | | |
| Decrease To: °F/psig/RH/Time | | | |
| Decrease To: °F/psig/RH/Time | | | |
| Decrease To: °F/psig/RH/Time | | | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | | | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | | Operational Test | |
| Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8) | 2400 ppm Boron | 2500 ppm boric acid w/ NaOH to ~10 pH | |
| Spray Density (gpm/ft$^2$) | | Not stated | |
| Spray Duration | | 10 days | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | N/A | | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | N/A | | |
| Time to Submergence | N/A | | |
| Dust Environment (-/2.2.11/2.2.11) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

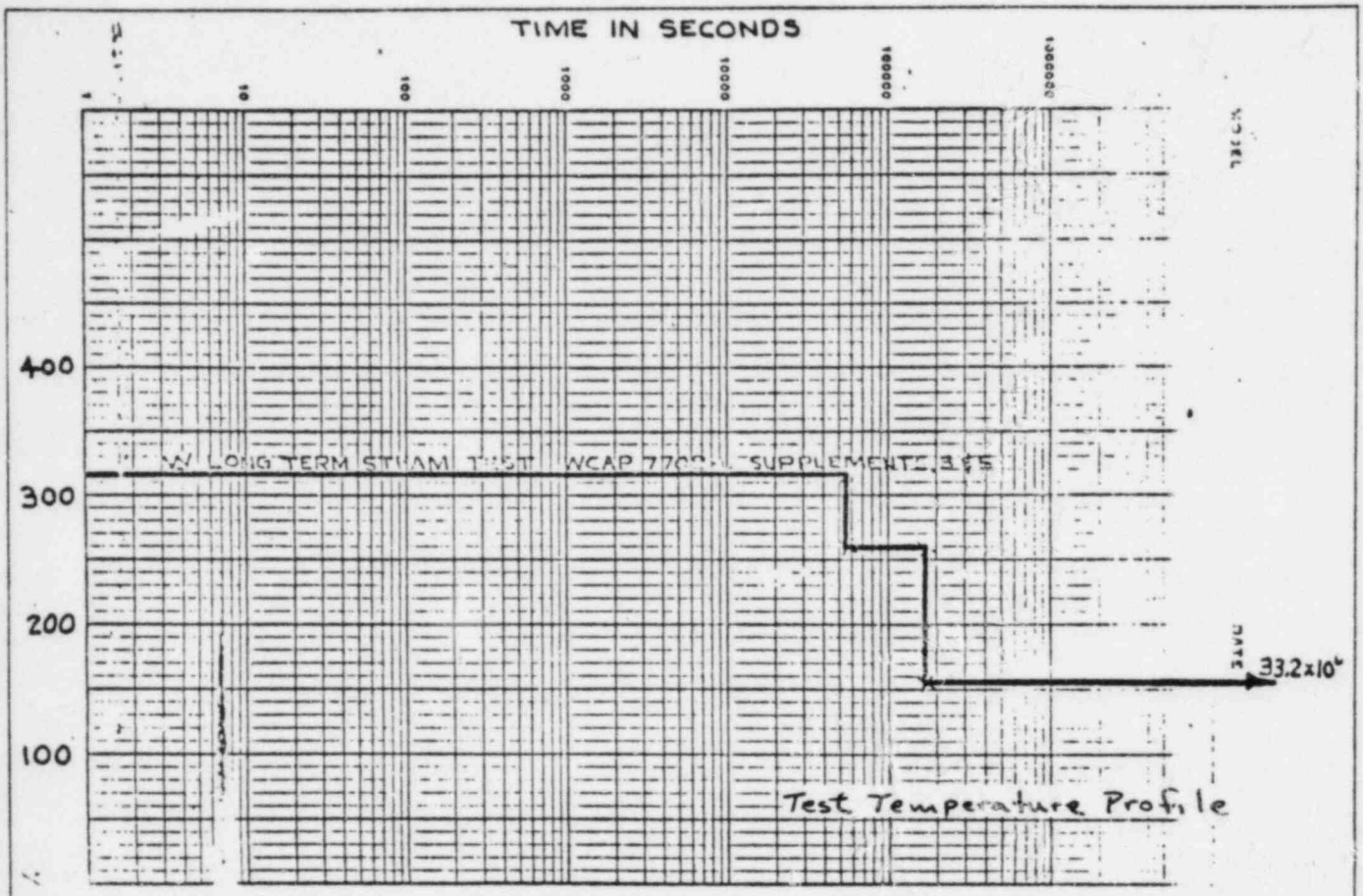
NOTES:

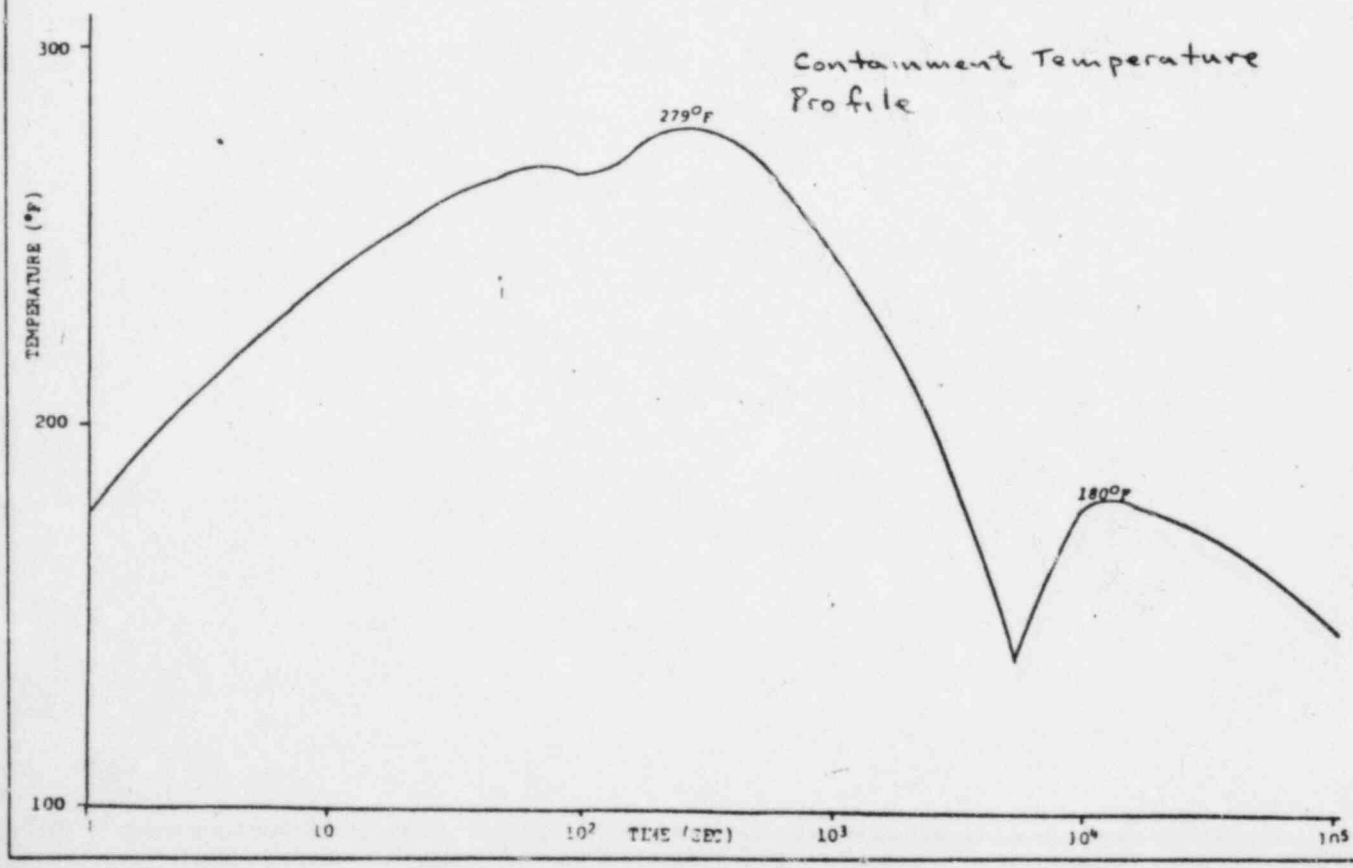
1. From reference [1577], the following statement is made regarding material aging:

> The normal schedule of the recombiner calls for periodic testing to determine system availability plus periods of non-operating time in normal containment environment. Evaluation of these factors leads to the conclusion that the most significant aging factor was the fatigue life of the structure, due to thermal stresses induced by the periodic heat up and cool down tests. It was concluded that the metal structures and metal-enclosed thermal insulation would not be affected by *time* alone. The heater life for this type of heater element is far in excess of the duty cycles imposed by the periodic tests; however, the duty cycles were included in the aging program since they are a necessary part of the recombiner test. The power cables are subject to deterioration due to aging: they are covered by IEEE-383, "Standard for Type Test of Class IE Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations" and have been qualified to Section 2.4 of this standard.

The reviewer finds this analysis to be acceptable. The documentation which supports the claim of a 40 year qualified life is consistant with the DOR guidelines and IEEE standards.

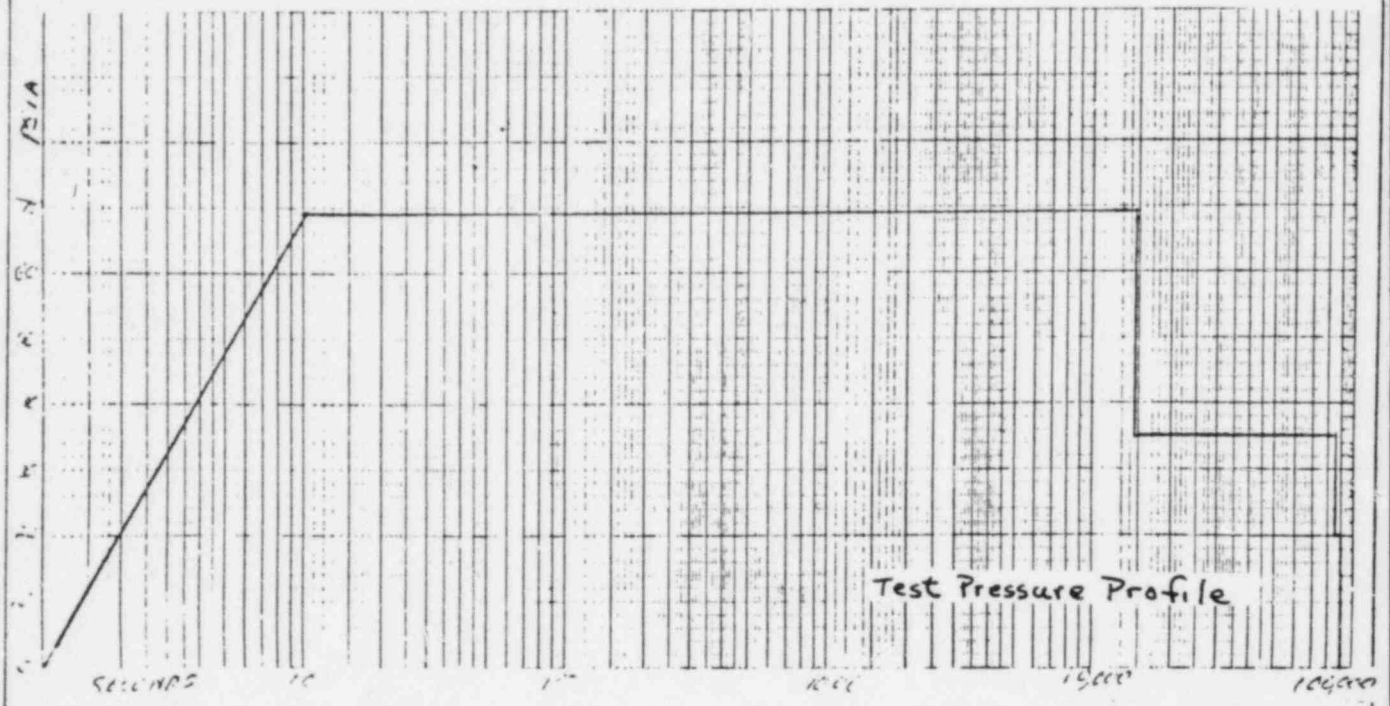
# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

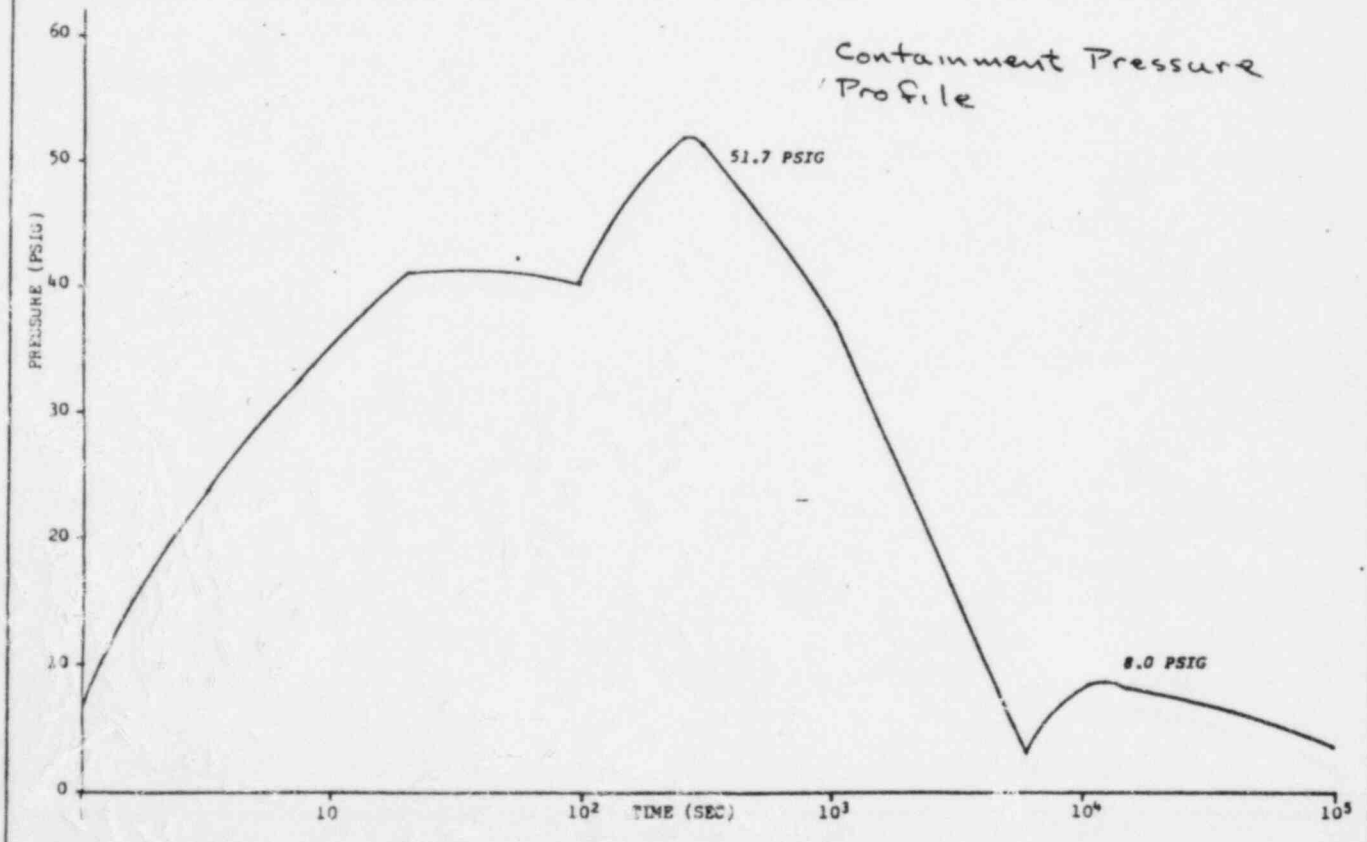


## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

NOTES:



# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ITEM NO. 87
MOTOR CONTROL CENTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A49
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 87
LICENSEE REFERENCE(S): 3518
FUNCTION (PLANT ID): SUPPLIES POWER TO ELECTRICAL LOADS (B52)
SERVICE: 480V
LICENSEE SUBMITTAL: SCEW(S): 30B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, (I), QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, ~~5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - ___ Equipment replacement with qualified equipment
  - X Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| (II.a) Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (H, QI, A)

This equipment is to be encapsulated to prevent steam entry into MCC.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

Refer to corresponding equipment summary sheet.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER

**EQUIPMENT:** MOTOR CONTROL CENTERS B52

**MANUFACTURER:** General Electric

**QUALIFICATION DISCREPANCY:**

Subject equipment lacks sufficient qualification documentation with respect to humidity.

**SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:**

The subject motor control centers provide 480V AC power to motor operated valves which operate to mitigate the consequences of a main steam line break outside of the primary containment. The MCC will have performed and completed its safety function within 60 seconds*after the start of an accident. Based upon engineering judgement, NNECO concludes that the MCC would satisfactorily perform its safety function since the environmental conditions within the MCC enclosures would not be as severe as the profiles identified for ambient conditions and thus would not prevent the performance of this equipment during the time for which its correct operation is credited. Due to the desirability of long term operability of this equipment each MCC will be encapsulated such to preclude the humid environment. This will be accomplished as soon as practicable prior to June 30, 1982 assuming that procurement delays do not preclude protection by that date.

*Except for aux feed valves. The motor operators for these valves will be replaced with air operators during the next refueling outage which is scheduled to commence in December 1981. This will make the auxiliary feed system AC power independent as indicated in the W. G. Counsil to R. A. Clark letter dated February 19, 1981.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

NOTES:

The licensee has referenced P&R 3518 as evidence of qualification for the exposure of this MCC to an HELB transient in addition to thermal aging.

- P&R 3518 is a report of an environmental test performed on an MCC (General Electric) which included the following stresses: radiation, thermal aging, seismic and temperature humidity.

  & the licensee did not provide any evidence of similarity for the tested equipment to that which is installed in the plant

  & the test is not reasonable for the specified accident and normal environments.

  - Some equipment failures are attributable to an accelerated thermal aging temp. that was in excess of component materials limits
  - the tested equipment was exposed to $10^6$ R of $\gamma$ radiation whereas the installed equipment sees no radiation or very mild dosages (as specified by the licensee).
  - the time/temperature test does not

cont. ⇒

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NOTES:

(continued from 5f) envelope the plant specific HELB condition.

tested ⇒ 131°F/90% humidity/4 days

HELB ⇒ 261°F/100% humidity/10 sec.

RT/2.7 hrs.

- No conclusions of the equipments ability to perform its' required safety function, when exposed to the accident environment, can be made from the referenced test report.

It should noted that the licensee has stated the equipment will be encapsulated to preclude steam entry to the MCC internals. This corrective action does not address the stresses on the equipment caused by elevated temperature or thermal aging.

∴ Therefore this equipment is categorized qualification not established 4.a.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ITEM NO. 88
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): 3513, 27
FUNCTION (PLANT ID): DEVELOPMENT CONTAINMENT SPRAY (P-43A, P-43B)
SERVICE: CONTAINMENT SPRAY
LICENSEE SUBMITTAL: SCEW(S): 21-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T), QT, RT, P, (H), CS, A, S, (R), M, I, (QM), RPN, (EXN), SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b.~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | X |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (T, H, QM-EXN)

Containment spray pumps are only required to operate for breaks inside containment-radiation is the only harsh environment.

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation which was provided by General Electric as applicable to the containment spray pump motors at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

NOTES:

The licensee has referenced PGR's 3513, 2513 and PSR's 27 and 29 as evidence of qualification for radiation exposure and thermal aging.

- Although PGR 3513 states a qualification level of $1 \times 10^6$ R for the tested insulation system, the "test" described does not establish that the motors will function in the specified environment. The materials analysis provided in this report lists radiation damage thresholds as:

Dacron Felt — Top Filler & Bracing — $8.6 \times 10^5$ R

Polyester Resin (unfilled) — "ties", coil nose Bracing — $5 \times 10^5$ R
Coil ground & Conn. Insulation
Coil ground Insulation

These values are below the specified dose of $8.67 \times 10^5$ R and should be substantiated by test or detailed analysis showing the degree of degradation and effect on insulation life. In addition the dosages should be considered with respect to thermal aging since many of the chemical degradation mechanisms are the same and will be accelerated by the heat generated during motor operation.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ITEM NO. 89
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
JOY MANUFACTURING MODEL 382651170
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 89
LICENSEE REFERENCE(S): 1559
FUNCTION (PLANT ID): FAN DRIVE (F-15A, F-15B)
SERVICE: ENGINEERING SAFEGUARD ROOM AIR RECIRCULATION FAN
LICENSEE SUBMITTAL: SCEW(S): 23-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:


| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, ~~5d, 5e~~, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | 7a~~, 7b, 7c~~ |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

SCEWS 23-B, reference 3 was provided by Joy Manufacturing Company as applicable to the ES Room Recirc. Fan at Millstone Unit 2.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION<br>Equipment Type | Electric motor | Electric motor | |
| Manufacturer's Name (5.2.2/-/-) | Reliance Electric | Reliance Electric | |
| Model Number (5.2.2/-/-) | 600277-14 | various | Note 1 X |
| Serial Number | not stated | not stated | |
| Features/Mounting (5.2.6/-/-) | not stated | class H type RH and RN insulation systems | |
| Connections/Interfaces (5.2.6/-/-) | not stated | not stated | |
| Location/Elevation | Aux. bldg. | not stated | |
| Equipment ID No. | F-15A,B | N/A | |
| QUALIFICATION REPORT (8.0/5.0/5.0)<br>Report ID Number | DUC-9 | DUC-9 | |
| Report Date | 7/1/78 | July 1, 1978 | |
| Issued by | Reliance | Reliance Electric | |
| Prepared for | Reliance | Reliance Electric | |
| Referenced Reports | not stated | Not stated | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | test + Analysis | test and analysis | |
| QUALIFICATION TEST PROGRAM<br>Functional Test Description (5.2.5/2.2.9/2.2.9) | N/A | Hipot | |
| Operating Conditions (-/2.2.10/2.2.10)<br>Load/Cycles/Voltage/ Current/Freq. | N/A | not stated | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | N/A | must pass failure checks: 120VAC - Between Cond. 600VAC - Between Windings 600VAC - to ground | |
| Accuracy (5.2.5/-/-) | Not stated | Not Applicable | |
| Number of Specimens | N/A | numerous | |
| Test Instruments Calibrated | N/A | not stated | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Active | Active | |
| Test Duration (5.2.1/-/-) | | N/A | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | 27 hrs (LOCA) | | |
| Required Function Time | long term | Not stated | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | N/A | Age, Age/irradiate | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | N/A | | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.3/4.0) Thermal Aging/Basis | Not stated | Arrhenious/statistical Analysis | Noted |
| Material Aging Evaluation (7.0/-/-) | Not stated | yes | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | Not stated | all nonmetallic components | |
| Radiation Aging, Type | γ | (γ) | |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | $8.6 \times 10^6$ R (acc. aging) | 204 mrd (total exposure) | |
| Radiation Aging, Dose Rate | not stated | $1 \times 10^6$ R/hr | |
| Radiation Aging, Method | not stated | test | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | Not stated | all non metallics | |
| Operational Aging (-/4.2/-) | Not stated | 1208 cycles (start/run/stop/run in reverse direction) | |
| Other Age Conditioning (-/4.2/-) | not stated | not stated | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 40 yrs. | 40 yrs. | |
| Normal Ambient Temperature | 104°F | not applicable | |
| Normal Ambient Radiation | not stated | | |
| Normal Ambient Humidity | not stated | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | not stated | not stated | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | not stated | not stated | |
| Margin (General) (6.0/3.0/3.0) | N/A | N/A | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-) | | | |
| 1. Temperature (+15°F) | | | |
| 2. Pressure (+10%, 10 psig max) | | | |
| 3. Radiation (not required) | | | |
| 4. Time (+10%, +1 hour + function time minimum) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

NOTES:

Note 1: The licensee has not provided any documented evidence of similarity for the installed motors to those tested in the referenced report

Note 2: Reliance Electric performed an aging program in which 50 motorettes were thermally aged at different temperatures until failure (voltage cycles as identified on page 5b- this equipment item) to establish a mean time to Failure data. This data was then plotted to establish an average life curve for various temperatures.

Note 3: The referenced test report did not discuss steam exposure at elevated pressure of either motorettes or entire motors.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ITEM NO. 90
ELECTRIC MOTOR LOCATED IN THE ELEV. 45'6", ZONE A2, A4, A5
SIEMANS-ALLIS, MODEL NOT STATED
REQUIRED OPERATING TIME: 180 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): 3514, 3515
FUNCTION (PLANT ID): PUMP DRIVE (P-41A, P-41B, P-41C)
SERVICE: HIGH PRESSURE SAFETY INJECTION
LICENSEE SUBMITTAL: SCEW(S): 25-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

Aging analysis utilizing Arrhenius Methodology completes qualification.

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

The licensee has referenced PGR's 3515 and 3514 as documented evidence of qualification for radiation exposure and thermal aging.

• PGR 3515 is an aging analysis performed on the nonmetallic materials of construction in the subject motors. Appended to the report are various vendor contacts. Page 42 of this document states the following:

"Dave Mullen of Siemens-Allis said that he could not further identify the magnet wire used on the 4160V motors. He said he could not even prove if the materials in the motors were the same as those listed in the December 19, 1980 letter. There are no records, and no tests to his knowledge (had) been run on the motors in question. He said that they have gone as far as they can on identifying materials and could be of no more help."

This statement invalidates any analysis that could be supplied by the licensee unless documented evidence can be supplied by the Vendor to substantiate the materials list.

• PGR 3514 does not contain enough information to establish qualification for radiation exposure. Only 4 materials are discussed. With respect to the lead cable the following conflicting information was given:

Our tests of irradiated winding components have been limited to those components used in the present Class F random wound and Class F VPI form wound systems. These components have proven to be functional following exposures to $2 \times 10^8$ RADS, with the exception of lead cable.

| Material | Tested | Similar Material Tested | Radiation Resistance Level |
|---|---|---|---|
| Mica Tape | | Yes | $10^9$ RADS |
| Varnish | | Yes | $10^9$ RADS |
| Lead Cable | Yes | | $10^3$ RADS |
| Magnet Wire | Yes | | $10^9$ RADS |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ITEM NO. 91
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
SIEMANS-ALLIS, MODEL NOT STATED
REQUIRED OPERATING TIME: 6 HOURS
TER CHECKSHEET NO. 91
LICENSEE REFERENCE(S): 3514, 3515
FUNCTION (PLANT ID): PUMP DRIVE (P-42A, P-42B)
SERVICE: LOW PRESSURE SAFETY INJECTION
LICENSEE SUBMITTAL: SCEW(S): 26-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e~~, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | X |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

Aging analysis utilizing Arrhenius Methodology completes qualification.

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

NOTES:

The licensee has referenced PGR's 3515 and 3514 as documented evidence of qualification for radiation exposure and thermal aging.

• PGR 3515 is an aging analysis performed on the nonmetallic materials of construction in the subject motors. Appended to the report are various vendor contacts. Page 42 of this document states the following:

"Dave Mullen of Siemens-Allis said that he could not further identify the magnet wire used on the 4160V motors. He said he could not even prove if the materials in the motors were the same as those listed in the December 19, 1980 letter. There are no records, and no tests to his knowledge (had) been run on the motors in question. He said that they have gone as far as they can on identifying materials and could be of no more help."

This statement invalidates any analysis that could be supplied by the licensee unless documented evidence can be supplied by the Vendor to substantiate the materials list.

• PGR 3514 does not contain enough information to establish qualification for radiation exposure. Only 4 materials are discussed. With respect to the lead cable the following conflicting information was given:

__ Our tests of irradiated winding components have been limited to those components used in the present Class F random wound and Class F VPI form wound systems. These components have proven to be functional following exposures to $2 \times 10^8$ RADS, with the exception of lead cable.

| Material | Tested | Similar Material Tested | Radiation Resistance Level |
|---|---|---|---|
| Mica Tape | | Yes | $10^9$ RADS |
| Varnish | | Yes | $10^9$ RADS |
| Lead Cable | Yes | | $10^8$ RADS |
| Magnet Wire | Yes | | $10^9$ RADS |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ITEM NO. 92
ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, ELEV. 14'6"
JOY MANUFACTURING MODEL 241753500
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 92
LICENSEE REFERENCE(S): 1803
FUNCTION (PLANT ID): CONTAINMENT AIR MIXING (F-18A, F-18B)
SERVICE: POST INCIDENT RECIRCULATION - 460 V
LICENSEE SUBMITTAL: SCEW(S): 9-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

SCEWS 9-A, reference 3 was provided by Joy Manufacturing Company as applicable to the Millstone Unit 2 P. I. R. Fans.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

NOTES:

The licensee has not established adequate similarity between the installed motor and that tested in the referenced report. The licensee's scow has described the installed motor as follows:

Manufacture: Joy Mfg. Co. (Reliance Electric Co. Motor) — Model Number: 24-17-5-3500
Special S/NGF15745, 15746

Whereas the referenced test report describes the tested motor as; 150/75 horsepower, 1200/600 RPM, D-5005 Frame, Class H type RN Insulation - Reliance Electric motor.

The DOR Guidelines require:

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

It should be noted that the referenced report does qualify the tested motor for the plant specific conditions.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ITEM NO. 93
ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, ELEV. 2'0", 36'0"
WESTINGHOUSE MODEL 7189007
REQUIRED OPERATING TIME: 8 DAYS
TER CHECKSHEET NO. 93
LICENSEE REFERENCE(S): 606
FUNCTION (PLANT ID): COOL CONTAINMENT AIR (F-14A, F-14B, F-14C, F-14D)
SERVICE: CONTAINMENT AIR RECIRCULATION SYSTEM - 460 V
LICENSEE SUBMITTAL: SCEW(S): 8-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | 5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | X |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

SCEWS 8-A reference 4 is provided by Westinghouse as applicable to the Millstone Unit 2 Car Fans.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| EQUIPMENT DESCRIPTION<br>Equipment Type | Electric motor | Electric motor | |
| Manufacturer's Name (5.2.2/-/-) | Westinghouse | Westinghouse | |
| Model Number (5.2.2/-/-) | Style 7189007 | N/A | |
| Serial Number | | N/A | |
| Features/Mounting (5.2.6/-/-) | N.D | 588.5 frame. CSP 2 winding, Thermalastic epoxy Insulation system | |
| Connections/Interfaces (5.2.6/-/-) | not stated | Air to water HX | X Note 1,3 |
| Location/Elevation | Containment | | |
| Equipment ID No. | F-14A,-D | | |
| QUALIFICATION REPORT (8.0/5.0/5.0)<br>Report ID Number | WCAP-7829 | WCAP-7829 | |
| Report Date | April 72' | April 72' | |
| Issued by | Westinghouse | Westinghouse | |
| Prepared for | Westinghouse | Westinghouse | |
| Referenced Reports | not stated | Not stated | |
| Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4) | Type Test | test type | |
| QUALIFICATION TEST PROGRAM<br>Functional Test Description (5.2.5/2.2.9/2.2.9) | N/A | IR, Dielectric strength | |
| Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq. | N/A | loaded to give equivalent of 200°C Hotspot in non-HX'r motor | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Acceptance Criteria (5.2.5/2.2.1/2.2.1) | N/A | not Stated | |
| Accuracy (5.2.5/-/-) | N/A | not Applicable | |
| Number of Specimens | N/A | 1 | |
| Test Instruments Calibrated | N/A | notstated | |
| Safety Function (Active/ Passive) (-/2.1.3/2.1.3) | Active | Active | |
| Test Duration (5.2.1/-/-) | | 20 hrs (5-4hr transients) 1 week | |
| Accident Duration (Envir. Above Normal) (5.2.1/-/-) | 27 hrs. | | |
| Required Function Time | 8 days | | |
| Test Sequence (General) (5.2.3/2.3.1/2.3.1) | | Age/mech. stress/stm/pres/γ (Chem spray) | |
| Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) | | | |
| 1. Representative Sample | | | |
| 2. Baseline Data | | | |
| 3. Performance Extremes | | | |
| 4. Thermal Aging | | | |
| 5. Radiation Aging | | | |
| 6. Wear Aging | | | |
| 7. Vibration/Seismic | | | |
| 8. DBE Exposure | | | |
| 9. Post-DBE Exposure | | | |
| 10. Inspection | | | |
| Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis | notstated | 21days/200°C (336hrs/220°C) | Note 2 |
| Material Aging Evaluation (7.0/-/-) | notstated | not stated | |
| Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) | Grease, Ink, motor to lead splice | not stated | |
| Radiation Aging, Type | γ | γ | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| Radiation Aging, Dose (rd) | $1.5 \times 10^8$ R (acc. + aging) | $1.4 \times 10^8$ R (acc. + Aging) | |
| Radiation Aging, Dose Rate | not stated | not cited | |
| Radiation Aging, Method | test | type test | |
| Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) | 6 recoat, Ins, motor to lead splice | all non metallics | |
| Operational Aging (-/4.2/-) | | operate 1 week at 237°F/1psig | |
| Other Age Conditioning (-/4.2/-) | | | |
| Qualified Life Claimed/ Established (5.2.4/4.10/-) | 40 years | 20 years continuous operation at 130°C Hotspot | X Note 2, 3 |
| Normal Ambient Temperature<br>Normal Ambient Radiation<br>Normal Ambient Humidity | not stated | | |
| On-Going Surveillance and Preventive Maintenance (7.0/-/-) | not Stated | | |
| On-Going Analysis of Failures and Degradation (7.0/-/-) | | | |
| Margin (General) (6.0/3.0/3.0) | | | |
| Margin (NUREG-0588, Cat. I) (-/3.2/-)<br>1. Temperature (+15°F)<br>2. Pressure (+10%, 10 psig max)<br>3. Radiation (not required)<br>4. Time (+10%, +1 hour + function time minimum) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE NO.) |
|---|---|---|---|
| ACCIDENT CONDITIONS | | | |
| LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5) | LOCA | LOCA | |
| Radiation Type | $\gamma$ | $\gamma$ | |
| Radiation Dose (rd) (4.1.2/1.4/1.4) | $1.5 \times 10^8$ R (acc. + aging) | $1.4 \times 10^8$ R (acc. ~~+ aging~~) | |
| Radiation Dose Rate (rd/hr) | ~~not stated~~ | not stated | |
| Radiation Qual. Method (5.3.1/-/-) | ~~type test~~ | test (type) | |
| Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6) | | | |
| Equipment Susceptible to Beta Radiation (4.1.2/-/-) | ~~not stated~~ | not stated | X Note 4 |
| Radiation Dose (Normal + Accident) (4.1.2/-/-) | $1.5 \times 10^8$ R | $1.4 \times 10^8$ R | |
| Plateout Dose Considered (-/1.48/1.48) | no | no | X Note 4 |
| Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7) | | | |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

| NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II) | LICENSEE SUBMITTAL | QUALIFICATION DOCUMENTATION | DEFICIENCY (X OR NOTE No.) |
|---|---|---|---|
| **ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS** | | | |
| Rate of Temp./Press. Increase | 175°/51.7 psig / 8.5 min. | 165°F/.5 hr. | |
| Peak: °F/psig/RH/Time | 279/51.7/100/8 min | 313 F / 77 psig / 100% / 4 hr. | |
| Decrease To: °F/psig/RH/Time | RTP/$10^5$ sec. (27 hrs.) | 1 week / 237°F/1 psig | |
| Decrease To: °F/psig/RH/Time | | | |
| Decrease To: °F/psig/RH/Time | | | |
| Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) | N/A | | |
| Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) | test | type test | |
| Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8) | 2400 ppm B | pH 9.5 to 10<br>1.43 wgt% $H_3BO_3$ (NaOH Buffer) | |
| Spray Density (gpm/$ft^2$) | not stated | .15 gal/min/$ft^2$ | |
| Spray Duration | not stated | 4 hours | |
| Submergence Duration (4.1.3/2.2.5/2.2.5) | | not Applicable | |
| In-Leakage Considered (5.2.6, 5.3.2/-/-) | | sealed motor (except for pressure equalization valves) | |
| Time to Submergence | | | |
| Dust Environment (-/2.2.11/2.2.11) | | | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

NOTES:

- These motors require qualification for steam/pressure exposure, radiation, chemical spray, and thermal aging.

Note 1: • The licensee has not specifically stated that the installed motors have an integral air to $H_2O$ HX's. If the motors are not constructed in this manner they are qualified only for short term post accident operation.

- The licensee has not specified the bearing lubricant currently being used in the installed motors.
- The licensee has not provided traceability for the installed motor to lead splice to that tested in the referenced report.

Note 2: The licensee has not provided an analysis to establish a 40 year qualified life from the data presented in the referenced test report. In addition a replacement schedual for subcomponents has not been provided (grease, bearings etc).

Note 3: The licensee has not provided evidence of similarity for the installed equipment to that tested in the referenced document.

Note 4: The licensee has not considered the effects of platout of $\beta^-$ emitters on the stator insulation materials when containment atmosphere enters the enclosure.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ITEM NO. 94
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A9
WESTINGHOUSE MODEL TCDP
REQUIRED OPERATING TIME: 2 HOURS
TER CHECKSHEET NO. 94
LICENSEE REFERENCE(S): 3522
FUNCTION (PLANT ID): PUMP DRIVE (P18A, P18B, P18C)
SERVICE: CHARGING PUMPS
LICENSEE SUBMITTAL: SCEW(S): 85-B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
| Summary of Licensee Responses to the NRC SER | 1b |
| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, ~~3b, 3c, 3d~~ |
| System Consideration Review | ~~4a, 4b, 4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

UIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

MMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

- ___ Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

ESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

| | |
|---|---|
| a Qualified | II.c Qualified Life Deficiency |
| b Modification | III.a Exempt |
| I.a Qualification Not Established | III.b Not in Scope |
| I.b Not Qualified | IV Documentation Not Available |

## EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

### EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | X |
| Aging Degradation Evaluated Adequately | X |
| Qualified Life or Replacement Schedule Established (If Required) | X |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | X |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | X |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | X |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | X |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

LICENSEE RESPONSE TO NRC SER

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (RPN, A,)

2 of 3 pumps now in service. The third pump will be replaced by 1-1-82. Technical Specifications only require operability of two (2) pumps. Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

FRC should review documentation.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

1. Originally installed pumps are in process of being replaced. Completion is planned for late 1981.
2. Pumps must run until the boric acid tanks are empty (2 hrs. max.) Ref. W. G. Counsil to R. Reid letters 3/22/79 and 4/9/79.
3. Motors must function in a radiation (only) environment.
4. Motor is designed for continuous operation. Temp. rise test duration was 5.5 hrs.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

NOTES:

These motors require qualification for radiation exposure and thermal ageing. The licensee has referenced PGR 3522 and PSR 35 to establish this.

- PGR 3522 contains information concerning radiation and thermal aging of motorettes constructed with a Class H random wound insulation system. The installed motors have PMR (Class H) insulation. The licensee has not stated that the qualified oil (bearing lube) is still being used in the installed motors.

  x Similarity has not been established between the tested and installed equipment.

- The tests performed in PGR 3522 do not establish the motors capability of withstanding the environment to which they are exposed. Motorette tests do not simulate the electrical and dynamic stresses placed on an insulation system during startup and operation under load.

- Motorette tests do not consider bearing systems or degradation of motor to lead splice and lead materials. The licensee should verify that these are qualified for the specific service environment.

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ITEM NO. 95
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT, ELEV. 1'6"
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 95
LICENSEE REFERENCE(S): 706
FUNCTION (PLANT ID): OPERATORS FOR SI-614, SI-624, SI-634, SI-644 (SI-614, SI-624, SI-634, SI-644)
SERVICE: SAFETY INJECTION TANK ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 23-A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

| Contents | Checksheet Page No. |
|---|---|
| Equipment Item | 1a |
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| Equipment Environmental Qualification Summary Forms | 2 |
| Licensee Response to NRC SER | 3a, 3b, ~~3c, 3d~~ |
| System Consideration Review | 4a, 4b, ~~4c, 4d, 4e, 4f~~ |
| Equipment Environmental Qualification Review | ~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~ |
| Installed TMI Lessons Learned Implementation Equipment Summary | ~~6a, 6b~~ |
| Maintenance and Replacement Schedule Summary | ~~7a, 7b, 7c~~ |

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

# EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

## EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | DESIGNATION: X = DEFICIENCY |
|---|---|
| Documented Evidence of Qualification Adequate | |
| Adequate Similarity Between Equipment and Test Specimen Established | |
| Aging Degradation Evaluated Adequately | |
| Qualified Life or Replacement Schedule Established (If Required) | |
| Program Established to Identify Aging Degradation | |
| Criteria Regarding Aging Simulation Satisfied (If Required) | |
| Criteria Regarding Temperature/Pressure Exposure: | |
| o Peak Temperature Adequate | |
| o Peak Pressure Adequate | |
| o Duration Adequate | |
| o Required Profile Enveloped Adequately | |
| o Steam Exposure (If Required) Adequate | |
| Criteria Regarding Spray Satisfied | |
| Criteria Regarding Submergence Satisfied | |
| Criteria Regarding Radiation Satisfied | |
| Criteria Regarding Test Sequence Satisfied | |
| Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied | |
| Criteria Regarding Functional Testing Satisfied | |
| Criteria Regarding Instrument Accuracy Satisfied | |
| Test Duration Margin (1 hour + Function Time) Satisfied | |
| Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) | |

| NRC QUALIFICATION CATEGORY | | DESIGNATION: X = CATEGORY |
|---|---|---|
| I.a | Equipment Qualified | |
| I.b | Equipment Qualification Pending Modification | |
| II.a | Equipment Qualification Not Established | |
| II.b | Equipment Not Qualified | |
| II.c | Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified | |
| III.a | Equipment Exempt From Qualification | X |
| III.b | Equipment Not in the Scope of the Qualification Review | |
| IV | Documentation Not Made Available | |

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

LICENSEE RESPONSE TO NRC SER

SCEWS No. 23-A
TER No. 21
Date: 8/21/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW
Millstone Unit 2
Docket No. 50-336

I) Summary of new information on SCEW sheet.

None

II) Response to SER concerns. (A)

Refer to description of surveillance and preventive maintenance program contained in body of submittal.

III) Response to TER concerns.

TER had no concerns.

IV) Proposed corrective action and schedule.

Equipment will be incorporated into plant surveillance and preventive maintenance program.

V) Justification for continued operation.

Not applicable

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

X Note 1: The Licensee (~~has~~/ has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

These values are administratively locked open in their accident mitigating position. The licensee should verify that they are locked in position with power removed or that a subsequent failure of the MVA will not cause the value to change position or affect any other safety related equipment or power supplies.

# 5. CONCLUSIONS

The tabulations in Section 4.2 represent a summary of the results of the equipment environmental qualification (EEQ) assessment conducted in accordance with the methodology presented in Section 3. The evaluations are based on the available qualification documentation provided by the Licensee, complemented in several cases by other relevant technical information. The major qualification deficiencies that have been identified and the results of the evaluation are shown in the Equipment Environmental Qualification Summary Forms (Tables 4-1, 4-2, 4-3, and 4-4).

Sections 4.3, 4.4, and Appendix C of this report present a detailed evaluation of (1) the Licensee's qualification methodology, (2) the equipment environmental qualification of each equipment item, and (3) the Licensee's response to the NRC SER. Although there were deficiences noted in the review, the evaluation revealed no items of outstanding concern for this plant.

On December 31, 1981, the Licensee submitted the following information concerning the TMI Action Plan equipment [58]:

On October 31, 1981, the Staff issued Reference (1), NUREG-0737, which delineated all of the items in the TMI Action Plan, NUREG-0660, which have been approved by the Commission for implementation. Some of the requirements of Reference (1) had previously been forwarded to licensees as part of the Short-Term Lessons Learned Task Force Final Report, NUREG-0578; these items were incorporated into Reference (1). Most of the requirements of Reference (1) have previously been addressed by Connecticut Yankee Atomic Power Company (CYAPCO), licensee for the Haddam Neck Plant, and Northeast Nuclear Energy Company (NNECO), licensee for Millstone Unit Nos. 1 and 2, in References (3), (4), (6), and (23). Where other previously docketed correspondence provides a partial or total response to Reference (1), the Staff is directed to the appropriate Reference. All references are listed in this forwarding letter.

A number of the Reference (1) requirements require implementation or submittal of information at this time. In response to Reference (1), CYAPCO and NNECO hereby provide Attachments 1, 2, and 3 for the Haddam Neck Plant, Millstone Unit No. 1, and Millstone Unit No. 2, respectively. Each of the Reference (1) requirements which requires licensee action by January 1, 1982 is addressed in the Attachment for each unit. Also included with each Attachment is an index identifying the items addressed in that Attachment.

Millstone Unit No. 2 is presently shut down for refueling and is expected to resume operation in mid-February. As noted in Attachment 3, there are several requirements which will not be fully implemented by the January 1, 1982 date required by Reference (1). NNECO will make every attempt to complete these items before start-up from the refueling outage, and will advise the Staff of the implementation status as the refueling outage progresses in subsequent correspondence. Recognizing that implementation of certain facets of the Action Plan items is contingent upon the timing of plant outages, it is noted that the next scheduled outage of the Haddam Neck Plant is for refueling in February, 1983. For Millstone Unit No. 1, the next scheduled outage is for refueling in September, 1982.

As discussed in the Attachments, there are various complications which have precluded completion of all Action Plan items by this date. These include equipment procurement and delivery delays, equipment qualification complications, procedural development constraints and schedular conflicts in training operations personnel in the use of the new hardware. Specific details are provided in the Attachment.

Although not all items have been completed on the schedule identified in NUREG-0737, CYAPCO and NNECO have concluded that continued safe operation is assured with the existing implementation status. It is also noted that no equipment qualification documentation is being included in this submittal. CYAPCO and NNECO plan to update previous plant-specific equipment qualification correspondence subsequent to receipt and review of the documentation from the respective vendors.

We trust the Staff will find the information presented in Attachments 1, 2, and 3 responsive to the requirements of Reference (1).

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Senior Vice President



Franklin Research Center
A Division of The Franklin Institute

Docket No. 50-336

Attachment 3

Millstone Nuclear Power Station, Unit No. 2

Post TMI Requirements
Implementation of NUREG-0737

December, 1981

Docket No. 50-336

Millstone Unit No. 2

INDEX


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| II.E.1.1 | Auxiliary Feedwater System Evaluation |
| II.E.1.2 | Auxiliary Feedwater Flow Indication |
| II.F.1.1 | Noble Gas Effluent Monitors |
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| II.F.1.3 | Containment High Range Radiation Monitor |
| II.F.1.4 | Containment Pressure Monitor |
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| II.K.2.25 | Effect of Loss of Alternating-Current Power on Pump Seals |
| II.K.3.30 | Small Break LOCA Methods |

II.B.1 Reactor Coolant System Vent

Item II.B.1 of Reference (1) requires that procedures for operator use of the reactor coolant system (RCS) high point vents be submitted by January 1, 1982. NNECO provided the NRC Staff with a description of the design and operation of the RCS vent system currently installed at Millstone Unit No. 2 in Reference (2). At that time it was noted that the procedures for operator use of the system were under development.

Preparation of the appropriate operating procedures for this system poses unusual difficulties as the system is intended to be utilized under conditions beyond the design bases of the plant. Specifically, definition of those symptoms indicative of noncondensible gas voids as well as the conditions during which use of the RCS vents is appropriate have delayed the preparation of procedures. PWR owners group guidance is being utilized to the optimum extent.

NNECO is currently developing RCS vent operating procedures for Millstone Unit No. 2. The complexities involved in preparation of the procedures for operation of this system preclude their submittal by January 1, 1982. The current schedule calls for submittal of the procedures required for the RCS high point vent system by July 1, 1982.

This schedule is considered appropriate based on the following. Interim procedures for the mitigation of noncondensible gas voids are currently in place at Millstone Unit No. 2. Plant modifications required for the RCS high point vents are complete with the system administratively tagged out of service. These two measures provide reasonable assurance that noncondensible voids would be adequately handled in the event of off-normal plant conditions.

The revised schedule for docketing the procedures for the RCS high point vent system is consistent with the recent amendment to 10CFR50.44 regarding hydrogen control. The revision to 10CFR50.44 requires operational RCS high point vents by the end of the first refueling outage after July 1, 1982. This results in an implementation date during the first quarter of 1983 for Millstone Unit No. 2. NNECO's revised schedule for submitting RCS vent system operating procedures by July 1, 1982 allows, in our judgment, for adequate Staff review prior to the inservice date required by the revised 10CFR50.44 which will be effective on January 4, 1982.

II.B.3 Post Accident Sampling System (PASS)

Item II.B.3 of Reference (1) requires that installation of the final post accident sampling systems be completed by January 1, 1982 and that final designs be available for review at that time.

After reviewing the existing sampling system at Millstone Unit No. 2 against the Reference (1) requirements, NNECO determined that a dedicated PASS was required. NNECO informed the Staff in Reference (9) of its intention to comply with the inservice date for Item II.B.3 of Reference (1); however, the Staff was also apprised of the potential for equipment delivery delays which would preclude completion of this item by January 1, 1982. The original equipment delivery date for the Millstone Unit No. 2 PASS was July, 1981. Design changes and prototype testing delayed equipment delivery to October 1981. As a result, installation of the PASS at Millstone Unit No. 2 will not be complete by January 1, 1982. Hardware installation will be completed during the current refueling outage which will extend into 1982.

Following hardware installation, several weeks of operational testing and debugging are required. Personnel training will then be performed on the operational system. Training is expected to require approximately one month. Therefore, NNECO revises its planned inservice date for Item II.B.3 to June 1, 1982 for Millstone Unit No. 2. The revised inservice date of June 1, 1982 represents a realistically attainable completion date by which installation, testing and training can be completed.

NNECO will maintain the interim sampling techniques described in Reference (10) at Millstone Unit No. 2 until the PASS becomes fully operational.

As was noted in Reference (9), the system currently being installed at Millstone Unit No. 2 does not include analysis capability for post accident cloride determination. To date, NNECO has not identified suitable equipment available commercially to properly and safely perform this function. NNECO therefore plans to defer installation until the next refueling outage scheduled for the Spring of 1983. Suitable equipment is expected to be developed and available at that time.

II.E.1.1 Auxiliary Feedwater System Evaluation

In References (35) and (36), NNECO committed to modify the steam driven auxiliary feedwater train to eliminate dependency on an alternating current power source. The modifications consisted of eliminating AC dependence for the steam driven auxiliary feedwater pump and the auxiliary feedwater flow control valves.

NNECO has been notified by the equipment vendors that the new valve actuators and the DC reversing starter are not expected to be delivered in time to complete installation during the current refueling outage. NNECO intends to complete these modifications during the next plant shutdown of sufficient duration. NNECO will complete as much work on this modification as possible without affecting normal system operation during the current refueling outage. The existing auxiliary feedwater flow control valve operators are both supplied from redundant, Class 1E, vital power sources and are equipped with handwheels for local, manual operation. Thus, there is assurance that auxiliary feedwater will be available when required.

NNECO intends to keep the Staff informed on the status of these modifications.

II.E.1.2 Auxiliary Feedwater Flow Indication

In Reference (34), NNECO informed the Staff that vendor delivery delays would preclude completing the installation of the safety-grade auxiliary feedwater flow indication channels at Millstone Unit 2 by July 1, 1981, as required by Reference (1). NNECO notes that the equipment has been received and installed and the safety-grade flow indication channels are operational. Qualification documentation was submitted in Reference (40). NNECO considers this item to be closed.

II.F.1.1 Noble Gas Effluent Monitor

II.F.1.2 Sampling and Analysis of Plant Effluents

Item II.F.1.1 of Reference (1) requires licensees to install extended range noble gas effluent monitors. Item II.F.1.2 of Reference (1) requires licensees to provide the capability for effluent monitoring of radioiodines under accident conditions.

The deviations from the Reference (1) design requirements for the Millstone Unit No. 2 high range effluent monitor were provided to the Staff in References (4) and (6). Additional information in support of these deviations for Items II.F.1.1 and II.F.1.2 was docketed in Reference (7). In Reference (8), the Staff informed NNECO of the acceptable resolution of the deviations from Items II.F.1.1 and II.F.1.2 of Reference (1) for Millstone Unit No. 2.

The equipment required in fulfillment of Items II.F.1.1 and II.F.1.2 of Reference (1) will be installed at Millstone Unit No. 2 prior to startup from the current refueling outage. Following installation, testing and debugging the final installation, as well as personnel training, will require a short period of time beyond January 1, 1982. NNECO expects the system to be fully operational by April 1, 1982. Isotopic calibration has been completed for a prototype system. Receipt of the calibration report to support system operation is expected shortly. In addition, information documenting the system qualification to IEEE 323-1974 will be available in early 1982.

As such, NNECO hereby identifies a revised implementation date for Items II.F.1.1 and II.F.1.2 for Millstone Unit No. 2 until April 1, 1982. The three month extension is necessitated to complete the testing of the high range effluent monitor system and to complete personnel training. Existing procedures for quantifying high level radioactive releases will remain in effect until the system is fully operational.

II.F.1.3 Containment High Range Radiation Monitor

In Reference (16), NNECO informed the Staff that the cable supplied for the containment high range radiation monitor at Millstone Unit No. 2 was not fully environmentally qualified and may not function properly under LOCA conditions. The Staff was originally informed of this qualification deficiency in Reference (19).

Millstone Unit No. 2 is presently shut down for refueling. NNECO intends to replace the unqualified cable with fully qualified cable before startup from the refueling outage, thus the schedular requriement for this item will be met. During cable replacement, NNECO will remove the detectors for calibration in the Millstone radiation calibration lab to meet the requirements of NUREG-0737.

II.F.1.4 Containment Pressure Monitor

Item II.F.1.4 of Reference (1) requires that licensees provide continuous indication of containment pressure in the control room.

Containment pressure monitoring instrumentation is currently being installed at Millstone Unit No. 2. The system will be operational prior to startup from the current refueling outage. The slight extension beyond the inservice date required by Reference (1) is justified as the plant is currently shut down for refueling.

The qualification status of this equipment was provided in Reference (40).

II.F.1.5 Containment Water Level Monitor

Item II.F.1.5 of Reference (1) requires that continuous indication of containment water level shall be provided in the control room for all plants.

NNECO is installing redundent wide-range level instruments at Millstone Unit No. 2 during the current refueling outage. This system is qualified to IEEE Standards 344-1971 and 323-1971. Efforts are proceeding to upgrade the system qualification to that of IEEE 344-1975 and IEEE 323-1974. The qualification effort is scheduled to be completed by July 1, 1982.

There currently exists at Millstone Unit No. 2 a narrow-range level indicator in the containment sump. This system was described in Reference (4). It is NNECO's position that the existing narrow-range level instrumentation at Millstone Unit No. 2 satisfies the requirements of Item II.F.1.5 of Reference (1). The basis for this position is presented in Reference (4).

Therefore, with the exception of the qualification documentation required for the wide-range level instrumentation, the requirements of Item II.F.1.5 of Reference (1) will be complete for Millstone Unit No. 2 before startup from the present outage. The qualification documentation is scheduled to be available by July 1, 1982.

II.F.1.6 Containment Hydrogen Monitor

Item II.F.1.6 of Reference (1) requires licensees to provide continuous indication of hydrogen concentration in the containment atmosphere. Indication shall be provided in the control room.

There currently exists containment hydrogen monitoring instrumentation at Millstone Unit No. 2. This equipment is being relocated to areas within the Plant which experience less severe environments during accident conditions. The relocation effort will be completed during the present refueling outage.

The existing hydrogen monitoring equipment is qualified to IEEE 344-1971. NNECO is reviewing the qualification documentation to determine what if any modifications are required to meet the Reference (1) qualification requirements. During this review, the hydrogen monitoring instrumentation will be fully operational at Millstone Unit No. 2.

II.F.2 Instrumentation for Detection of Inadequate Core Cooling

Item II.F.2 of Reference (1) requires licensees to install sufficient instrumentation to provide an unambiguous, easy-to-interpret, indication of inadequate core cooling. In Reference (6), NNECO provided the Staff with a description of the system being considered for installation of Millstone Unit No. 2. NNECO has actively participated in the development of inadequate core cooling instrumentation through the various Owners Groups. Specifically, NNECO has participated in the evaluation of ICC detection systems which use the following sensors or systems; Heated Junction Thermocouple System (HJTCS), Core Exist Thermocouples, Incore thermocouples, self powered Neutron detectors (spnDs), Excore Neutron Detectors (ECNDsO, and reactor vessel d-p cells.

NNECO has evaluated the various reactor vessel water level indicating systems and has concluded that the CE Heated Junction Thermocouple System has the potential to provide an unambiguous indication of vessel water level under transient and accident conditions. Together with the Subcooled Margin Monitor and the core exit thermocouples, the HJTCS is intended to be utilized to provide indication of ICC as required by Item II.F.2 of Reference (1).

NNECO has determined that it would be inappropriate to commit to installation of the HJTCS until it has been proven that the system will provide an unambiguous indication of reactor vessel water level. Therefore, given successful completion of the testing and qualification of the HJTCS, NNECO intends to install the system at Millstone Unit No. 2. A schedule for installation will be provided upon completion of these efforts.

II.K.2.13 Thermal Mechanical Report

NNECO has participated in C-E Owners Group activities which respond to the requirements of NRC Action Plan Item II.K.2.13, "Thermal Mechanical Report--Effect of High-Pressure Injection on Vessel Integrity for Small-Break Loss-of-Coolant Accident with no Auxiliary Feedwater." As a result of this effort, the C-E Owners Group submitted to the NRC staff for review report CEN-189, "Evaluation of Pressurized Thermal Shock Effects due to Small Break LOCA's with Loss of Feedwater for Combustion Engineering NSSS," December, 1981, by a letter December 31, 1981. This report describes the analytical methods used in all analytical evaluations and reports plant-specific analysis results in separate appendices. In particular, Appendix E, "Evaluation of Pressurized Thermal Shock Effects Due to Small Break LOCA's with Loss of Feedwater for the Millstone Unit No. 2 Reactor Vessel," contains the results for the Millstone Unit No. 2 vessel. NNECO hereby references report CEN-189 and Appendix E to report CEN-189 on Docket No. 50-336 in response to the documentation requirements of NRC Action Plan Item II.K.2.13.

NRC Action Plan Item II.K.2.13, as clarified in NUREG-0737, requires that "a detailed analysis shall be performed on the thermal-mechanical conditions in the reactor vessel during recovery from small breaks with an extended loss of all feedwater." The requirement "deals with the potential for thermal shock of reactor vessels resulting from cold safety injection flow." Report CEN-189 provides the required analysis.

The results contained in report CEN-189 and in Appendix E demonstrate that Millstone Unit No. 2 can safely withstand a small break loss of coolant accident with extended loss of feedwater for the full design life of the plant without crack initiation.

II.K.2.17 Potential For Voiding In The Reactor Coolant System During Transients

NNECO has participated in a C-E Owners Group program to respond to the requirements of NRC Action Plan Item II.K.2.17, "Potential for Voiding in the Reactor Coolant System During Transients." This item is a requirement to "analyze the potential for voiding in the reactor coolant system (RCS) during anticipated transients." The C-E Owners Group program analyses have been completed. These analyses demonstrate that if voiding occurs in a Combustion Engineering RCS during anticipated transients, the NRC acceptance criteria for these transients are still met. The documentation of these anlaysis results is presently being prepared and is expected to submitted by the C-E Owners Group to NRC for review no later than March 31, 1982.

NNECO believes that the analysis results from the C-E Owners Group program are applicable to the Millstone Unit No. 2. When the documentation of these results is submitted by the C-E Owners Group to NRC, NNECO will reference these results for application to Docket No. 50-336.

Additional information was provided to the Staff in response to Generic Letter No. 81-21 in Reference (41).

II.K.2.19 Sequential Auxiliary Feedwater Flow Analyses

NNECO has determined that NRC Action Plan Item II.K.2.19 is not applicable to the Millstone Unit No. 2. This understanding is based on the following statement from NUREG-0843, "St. Lucie 2 Safety Evaluation Report," October, 1981.

> "Sequential auxiliary feedwater flow analytical requirements is only of concern to once-through steam generator designs. Since C-E utilizes inverted U-tube steam generator designs, requirements set forth by Item II.K.2.19 are not applicable. As such, the licensee is not required to address the item."

Therefore, no further work related to Item II.K.2.19 to planned.

II.K.3.25 Effect of Loss of Alternating-Current Power on Pump Seals

Item II.K.3.25 of Reference (1) requires licensees to determine, on a plant-specific basis, the consequences of loss of cooling water to the reactor recirculation pump and coolers.

The reactor coolant pump seals at Millstone Unit No. 2 are cooled by the reactor building closed cooling water (RBCCW) system which is in turn cooled by the service water system. Both systems are powered by the emergency diesel generators in the event offsite power is lost.

It is NNECO's position that adequate seal cooling would be provided to the reactor coolant pumps at Millstone Unit No. 2 following a loss of offsite power.

II.K.3.30 Small Break LOCA Methods

Item II.K.3.30 of Reference (1) requires that licensees provide additional information for small break loss-of-coolant-accident model justification and/or revised analysis models by January 1, 1982. NNECO informed the Staff in Reference (14) that the current fuel vendor for Millstone Unit No. 2 would provide a revised small break LOCA model as well as a specific analysis for the Plant.

As noted in Reference (14), special effects simulation addressing the TMI concerns were originally scheduled to be complete by January 1, 1982, with specific application to Millstone Unit No. 2 complete by April 1, 1982. NNECO has since been informed that the fuel vendor intends to complete the required small break LOCA model revisions by April 1, 1982 with the specific application to Millstone Unit No. 2 complete by July 1, 1982. This information has been provided to the Staff by the fuel vendor in Reference (13).

We trust you will find this revised schedule responsive to the requirements of Item II.K.3.30 of Reference (1).

# 6. REFERENCES

The references listed in this section of the report were used to develop the Equipment Environmental Qualification evaluation for this plant. The references have been separated into two lists: (1) Plant-Specific References and (2) Plant Generic References. All non-generic documents are listed on the "Plant-Specific References" list. All qualification documents that could be applicable to equipment installed in several plants were listed on the "Plant Generic References" list. These documents include topical reports, test reports, component and material analyses, etc. cited by the Licensee as evidence of qualification in accordance with the documentation reference instructions established by IE Bulletin 79-01B. Since these documents were compiled by a computer data base, the citation numbering was computer generated and the same document has the same generic reference number in all Technical Evaluation Reports prepared under this equipment qualification program.

Throughout the text of the report, references are designated by a bracketed number; the reference numbers are not presented in sequential order.

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Letter to D. G. Eisenhut, NRC. Subject: Millstone Nuclear Power Station, Unit No. 2, Environmental Qualification of Electrical Equipment (Attached)
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A01204

2. G. Lainas
Letter to A. Schwencer, NRC. Subject: Electrical Equipment Environmental Qualification
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3. N. C. Moseley
Letter to B. H. Grier et al., NRC. Subject: Supplement No. 2 to Bulletin 79-01B, Environmental Qualification of Class 1E Equipment
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4. N. C. Moseley
Letter to B. H. Grier et al., NRC. Subject: Supplement No. 3 to Bulletin 79-01B, Environmental Qualification of Class 1E Equipment
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5. S. J. Chilk
Memorandum and Order Pursuant to Union of Concerned Scientists Petition for Emergency and Remedial Relief
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6. Technical Evaluation Report: Equipment Environmental Qualification; Northeast Nuclear Energy Company, Millstone Nuclear Power Station, Unit 2
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7. Clarification of TMI Action Plan Requirements
USNRC, 00-Nov-80
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8. W. G. Counsil
Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification of Safety-Related Electrical Equipment
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10. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Millstone Nuclear Power Station Unit 2
USNRC, 27-May-81

11. W. G. Counsil
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Northeast Utilities, 09-Feb-82
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13. R. F. Thibault
Letter to E. R. Foster, NNEC. Subject: Electrical Terminal Block Testing
General Electric, 02-Feb-78
G-EH-8-16, Proprietary

14. R. F. Thibault
Letter to J. De Rose, NUSCO. Subject: Millstone Unit 2 Terminal Strips
General Electric, 18-Oct-79
G-EH-9-141, Proprietary

15. R. L. Hofer
Letter to L. C. Albee, NUSCO. Subject: Millstone Unit 2 Westinghouse Electric Recombiner
Westinghouse, 01-Oct-80
NEU-3546, Proprietary

16. R. E. Loomis
Certification of Compliance for Northeast Nuclear Energy Company. Part No. EA740-50000
NAMCO Controls, 30-Apr-79
Proprietary

17. R. E. Loomis
Certification of Compliance for Northeast Nuclear Energy Company. Part No. EA180-32302
NAMCO Controls, 04-May-79
Proprietary

18. R. E. Loomis
Certification of Compliance for Northeast Nuclear Energy Company. Part No. EA180-31302
NAMCO Controls, 30-Apr-79
Proprietary

19. R. E. Loomis
Certification of Compliance for Northeast Nuclear Energy Company. Part No. EA740-80100
NAMCO Controls, 27-Apr-79
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20. R. E. Loomis
Certification of Compliance for Northeast Nuclear Energy Company. Part No. EA740-80000
NAMCO Controls, 27-Apr-79
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# APPENDIX A - ENVIRONMENTAL SERVICE CONDITIONS

The specific environmental service conditions corresponding to different plant locations that were used in this technical evaluation are stated in this appendix, based upon the information presented in Reference 11 and the plant FSAR.

The temperature and pressure profiles contained herein form the basis for the temperature and pressure noted by the Licensee in the "Environment Required" column on the Licensee's Equipment Qualification Report Evaluation sheets.

This appendix contains the following curves:

Figure A-1. Containment Temperature vs. Time (LOCA) (Licensee Profile 18)

Figure A-2. Containment Pressure vs. Time (LOCA) (Licensee Profile 19)

Figure A-3. West MSIV Room Temperature vs. Time (Licensee Profile 20)

Figure A-4. East MSIV Room Temperature vs. Time (Licensee Profile 21)

Figure A-5. Turbine Building Temperature vs. Time (El. 14'6') (Licensee Profile 22)

Figure A-6. Turbine Building Temperature vs. Time (El. 54'6") (Licensee Profile 23)

Figure A-7. Auxiliary Building Temperature vs. Time (El. 36'6") (Licensee Profile 24)

Based on these considerations, each equipment item was evaluated with respect to the environmental service conditions presented in this appendix.

The Licensee stated that the methodology for the development of environmental service conditions is contained in the plant FSAR.

## Accident Conditions Inside Primary Containment

For PWR plants, the DOR Guidelines state that the environmental service conditions inside containment for the loss-of-coolant accident (LOCA) should be established by the Licensee based on the FSAR analysis. In addition, for plants equipped with automatic containment spray systems not subject to single

component failure or delayed initiation, the Guidelines state that equipment qualified for the LOCA environment is also considered qualified for the postulated main-steam-line break accident (MSLB). The design of this plant satisfies these criteria. The Licensee has stated that equipment qualified for a LOCA environment can be considered qualified for a MSLB accident environment.

The Licensee provided the following response with respect to temperature margins applied to the primary containment accident profile [11]:

"B.1 CONTAINMENT PROFILES, TEMPERATURE AND PRESSURE

The information presented in Reference (32) is duplicated below:

> 'The design basis temperature and pressure conditions for Millstone Unit No. 2 results from a postulated LOCA. The MSLB accident was also evaluated and although a comparable peak value was calculated, the duration of the transient was found to be shorter and the LOCA remains limiting. The profiles utilized in the qualification effort were based upon FSAR analyses, have been provided in earlier revisions of this report, and are presented in Appendix II. The analytical methodology employed to develop these profiles is consistent with applicable NRC requirements.'

In Reference (42), the Staff alleged that insufficient information was provided to substantiate the validity of the values specified. NNECO has subsequently been informed that the basis for the Staff position was that the values utilized did not satisfy the Staff's 'screening criteria', as defined in the July 7-10 meeting.

NNECO responded to these alleged deficiencies in Reference (43). Although Reference (43) was docketed approximately one month prior to the issuance of Reference (44), Reference (44) is identical in content to Reference (42) with respect to temperature and pressure inside containment. This suggests to NNECO that the Staff either failed to review or failed to understand Reference (43). Reference (43) continues to constitute NNECO's response and reiterates that 279°F and 51.7 psig remain the qualification limits. The methods used to arrive at these results are in full conformance with the provisions of NUREG-0588 and DPR-65.

B.4 ENVIRONMENTS - HUMIDITY, INSIDE CONTAINMENT

The information in Reference (32) is duplicated below:

'The relative humidity of the air surrounding the Category 1 equipment has been conservatively assumed to be 100% for the duration of the elevated temperature and pressure condition resulting from a LOCA or a HELB unless otherwise noted in the System Component Evaluation Work Sheets (SCEWS) in Appendix II. Additionally, it is assumed that the entire compartment associated with HELB instantly saturates with steam, even though the Category 1 equipment may be separated by long distances and torturous pathways from the HELB. This approach assures that an appropriate level of conservatism has been employed in this evaluation.'

The Staff did not identify any concern with this approach.

B.8 MARGIN

On several occasions during the course of the July 7-10 meeting, the Staff raised questions and concerns regarding the adequacy of the margin available for the various parameters involved in the qualification process. To supplement the information provided in this report, NNECO's general treatment of the margin question is summarized as follows.

For the vast majority of parameters and components evaluated, there exists a substantial margin between the minimum acceptable value based upon a plant-specific evaluation and the qualified value of the component in question. Availability of this margin is typical of many aspects of plant design and operation, and is indicative of the conservatism available in the design of the facility. Further, NNECO notes that the methodology utilized to develop the minimum acceptable qualification parameter limits includes sufficient conservatism to obviate further arbitrary conservatism. The methodology used is quite distinct from the technique of calculating a best-estimate value, in which case it would be appropriate to add some arbitrary conservatism to the final result of this calculation.

The details of the methods used are presented in these sections of this report which address the individual qualification parameters. Examples of this concept include:

- Submergence - The calculation included the entire inventory of all credible water sources available on-site.

- Radiation - A source term representative of an extremely degraded core, as specified in the DOR Guidelines, was assumed.

- Chemical Spray - The maximum available boric acid concentration, some 680 ppm higher than the Technical Specification minimum value for the RWST, was assumed.

NNECO therefore concludes that it is not necessary to impose additional margin beyond the conservatively calculated qualification values to

assure that safety-related electrical equipment will perform its design function when exposed to a harsh environment."

With respect to service conditions outside containment, the Licensee stated [11]:

"B.7 AREAS OUTSIDE CONTAINMENT

The information presented in Reference (32) is duplicated below:

'The design basis temperature and pressure conditions for areas outside containment were provided in earlier revisions of this report and are presented in Appendix II. FSAR analyses, as amended, served as the basis for the calculation of the temperature and pressure environments.'

In Section 3.4 of References (42) and (44), the Staff concluded that the temperature, pressure, and humidity parameters previously specified are acceptable. The submergence parameter was addressed in Section B.3."

With regard to submergence inside containment, the Licensee stated [11]:

"B.3 ENVIRONMENTS - SUBMERGENCE

The information presented in Reference (32) is duplicated below:

'In previous docketed correspondence submitted in response to I&E Bulletin No. 79-01, as amended and supplemented, the appropriate submergence value for Millstone Unit No. 2 was identified and utilized. A conservative representation of the maximum inventory which could result from a LOCA was identified to be 88,000 cubic feet. This corresponds to a depth of water of 8.1 feet above the containment floor. This value is utilized as appropriate on the System Component Evaluation Work Sheets (SCEWS) in Appendix II.'

The Staff concerns identified in Reference (44) are identical to those contained in Reference (42). Again, NNECO's detailed response was provided in Reference (43) and the Staff apparently failed either to review or understand NNECO's response. NNECO reiterates the following significant points of Reference (43):

- Submergence levels inside containment were determined using very conservative assumptions.

- Reference (30) states that 'qualification documentation for TMI Action Plan equipment not yet installed which does not require pre- implementation review should be submitted to NRC for review by the implementation date.' Thus it is inconsistent with Reference (30) and misleading to require NNECO 'to supplement the information presented and justify the adequacy of the design on an interim basis', prior to

the due date for submittal of any documentation associated with this TMI Action Plan item."

With regard to submergence outside containment, the Licensee stated [11]:

"o The potential for submergence outside containment was thoroughly evaluated in the FSAR and summarized in Reference (43).

NNECO concludes that the Reference (43) information is responsive to the Staff concerns."

With regard to chemical spray, the Licensee stated [11]:

"B.5 ENVIRONMENTS - CHEMICAL SPRAY

The information presented in Reference (32) is duplicated below:

'Equipment subject to harsh chemical environments due to actuation of the containment spray system is identified on the System Component Evauation Work Sheets (SCEWS). The operation of this system is detailed in the Millstone Unit No. 2 FSAR, Section 6.4. The composition of the spray is less than 2400 ppm boron as derived from the Refueling Water Storage Tank.'

The Staff concluded this approach was acceptable in References (42) and (44)."

With respect to radiation values inside primary containment, the Licensee stated [11]:

"B.2 ENVIRONMENTS - RADIATION PROFILES

The information presented in Reference (32) is duplicated below:

'By letter dated December 31, 1979, Northeast Nuclear Energy Company (NNECO) docketed the results of calculations performed to ascertain the radiation service conditions resulting from a design basis accident. The methodology employed was consistent with the criteria promulgated by the NRC in NUREG-0578, and is thoroughly discussed in the December 31, 1979 submittal. Results for the 40-year normal operating dose, the LOCA dose, and the total dose were presented. These results remain applicable and are listed on the System Component Evaluation Work Sheets (SCEWS) of Appendix II as appropriate.'

In Reference (42), the Staff requested additional information to justify the use of values less than the Staff's 'screening criteria.' NNECO submitted in Reference (43) a detailed and comprehensive response including the bases, assumptions, calculations, and results to substantiate the validity of the values utilized in the qualification process. It was noted there that the Reference (42) criterion for

equipment inside containment was more severe than the values specified in the DOR Guidelines or NUREG-0588.

Despite the level of detail provided in Reference (43), the Staff did not even acknowledge receipt of this material in Reference (44). Inasmuch as the methodology utilized to calculate radiation service conditions is in full conformance to the DOR Guidelines, NNECO concludes that the Reference (43) information constitutes a satisfactory response to Reference (44). If the Staff disagrees with this conclusion, we request that the Staff first review Reference (43) before rendering its views in the supplemental SER."

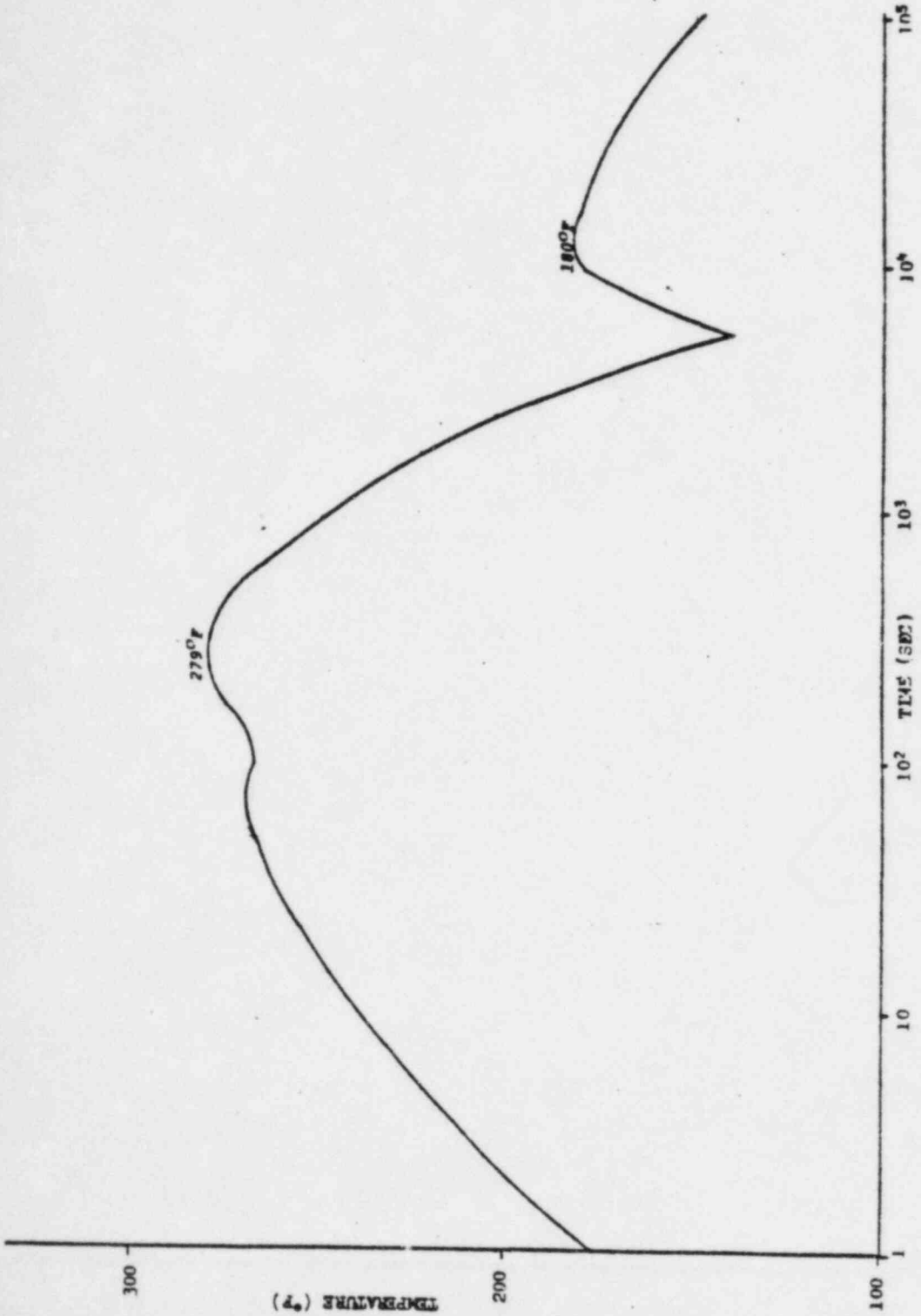



Figure A-1. Containment Temperature vs. Time (LOCA) (Licensee Profile 18)

FIGURE SUPPLIED
BY THE LICENSEE

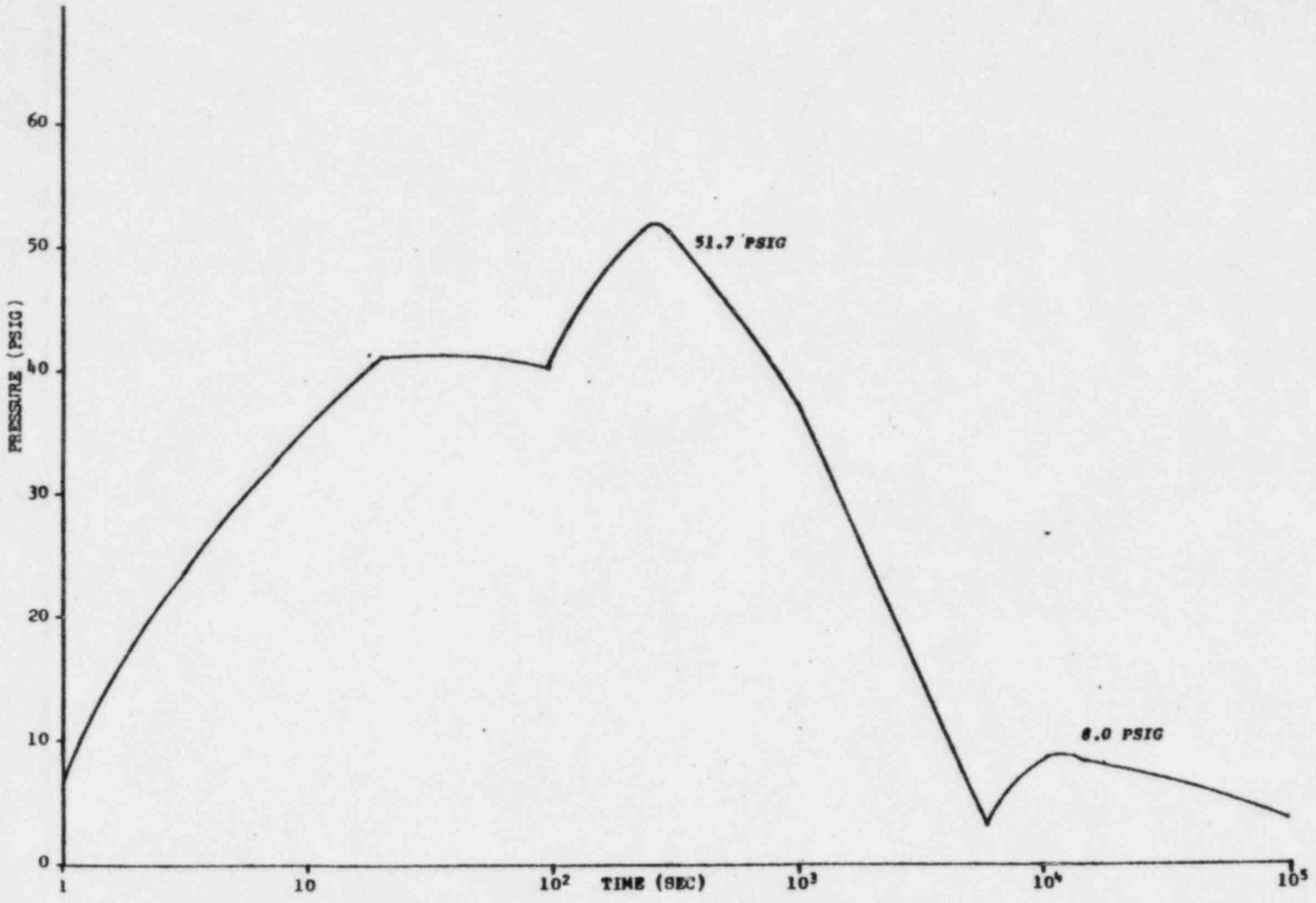



Figure A-2. Containment Pressure vs. Time (LOCA) (Licensee Profile 19)

FIGURE SUPPLIED
BY THE LICENSEE

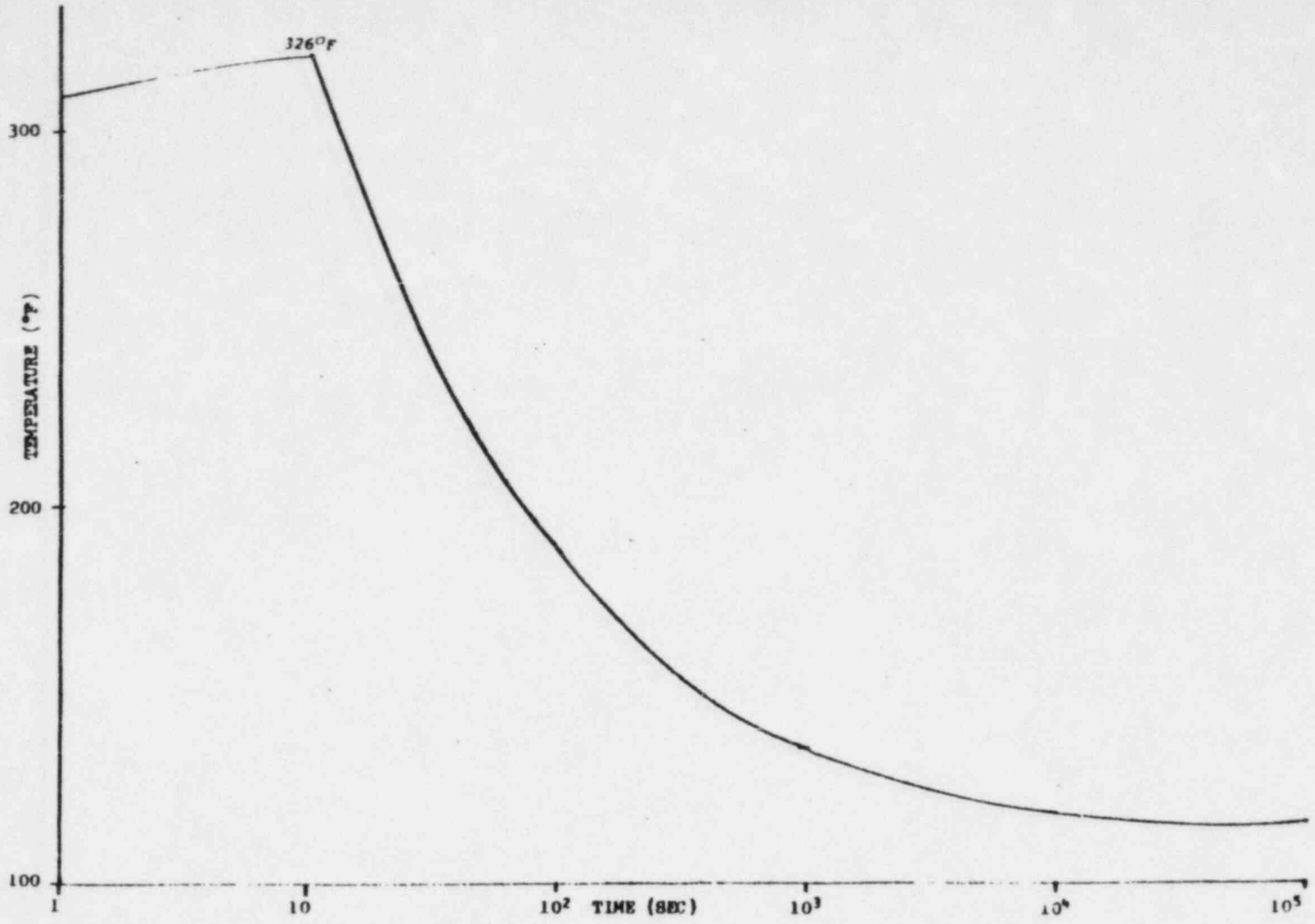



Figure A-3. West MSIV Room Temperature vs. Time (Licensee Profile 20)

FIGURE SUPPLIED
BY THE LICENSEE

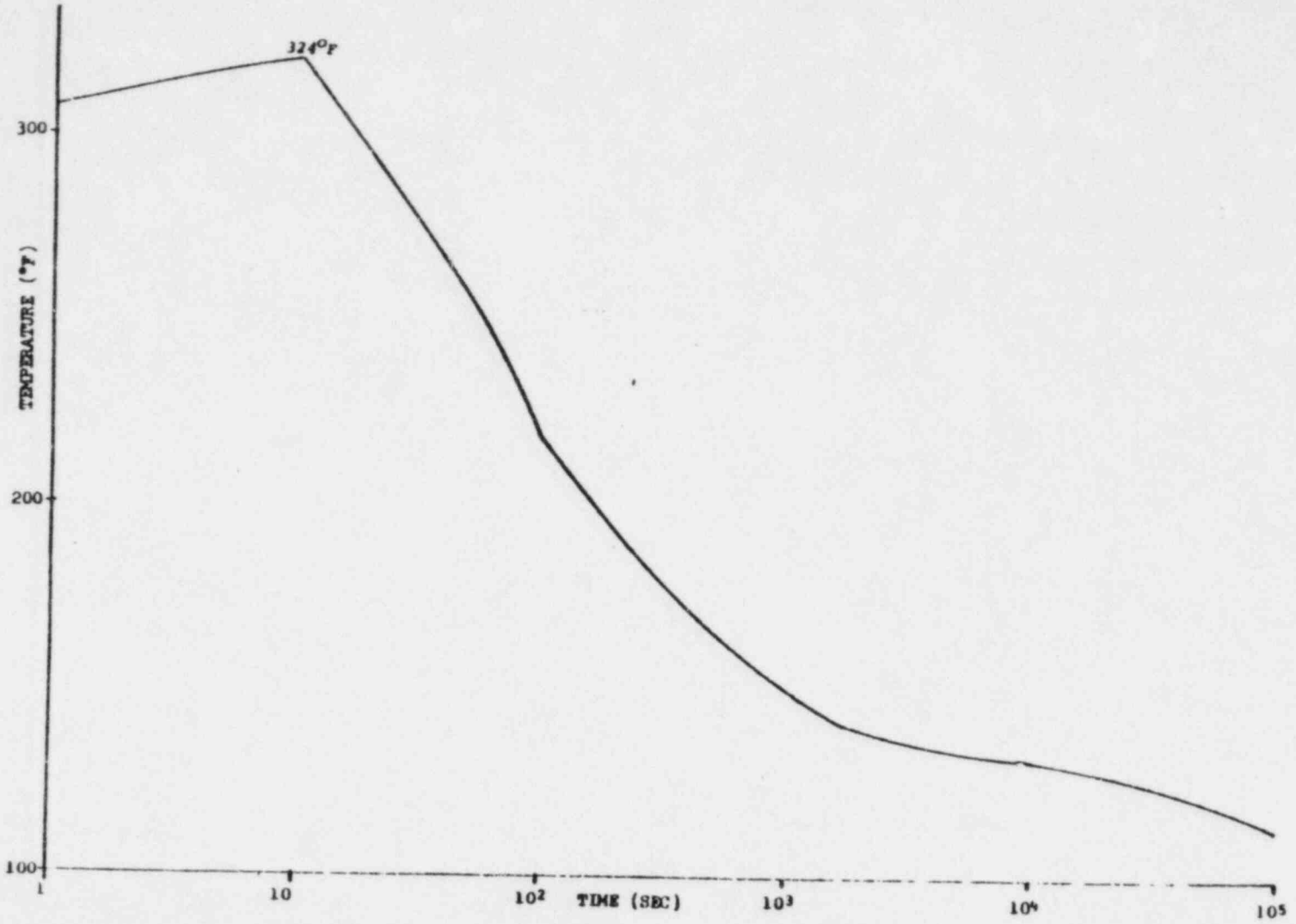



Figure A-4. East MSIV Room Temperature vs. Time (Licensee Profile 21)

FIGURE SUPPLIED
BY THE LICENSEE

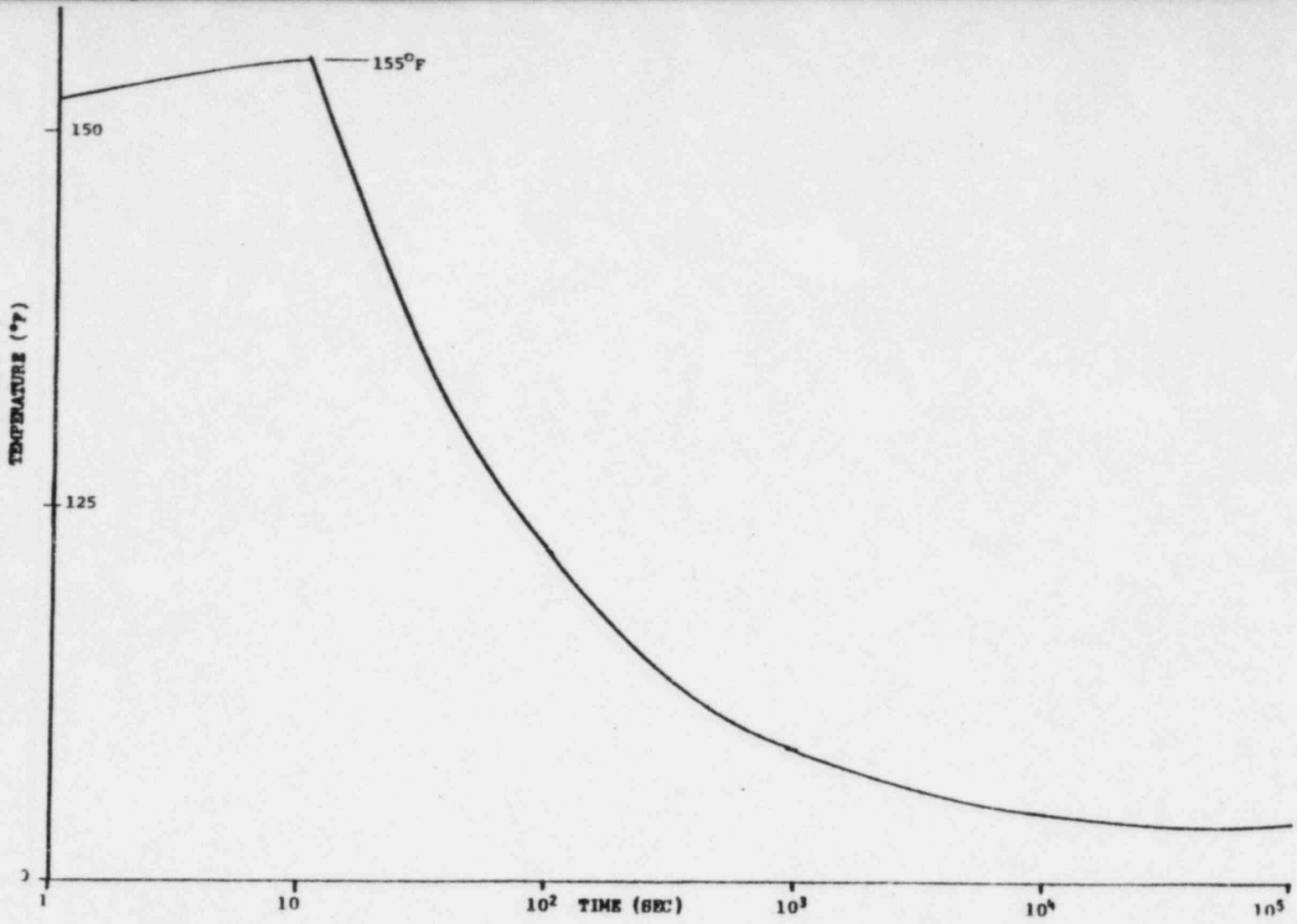



Figure A-5. Turbine Building Temperatures vs. Time (El. 14'6') (Licensee Profile 22)

FIGURE SUPPLIED
BY THE LICENSEE

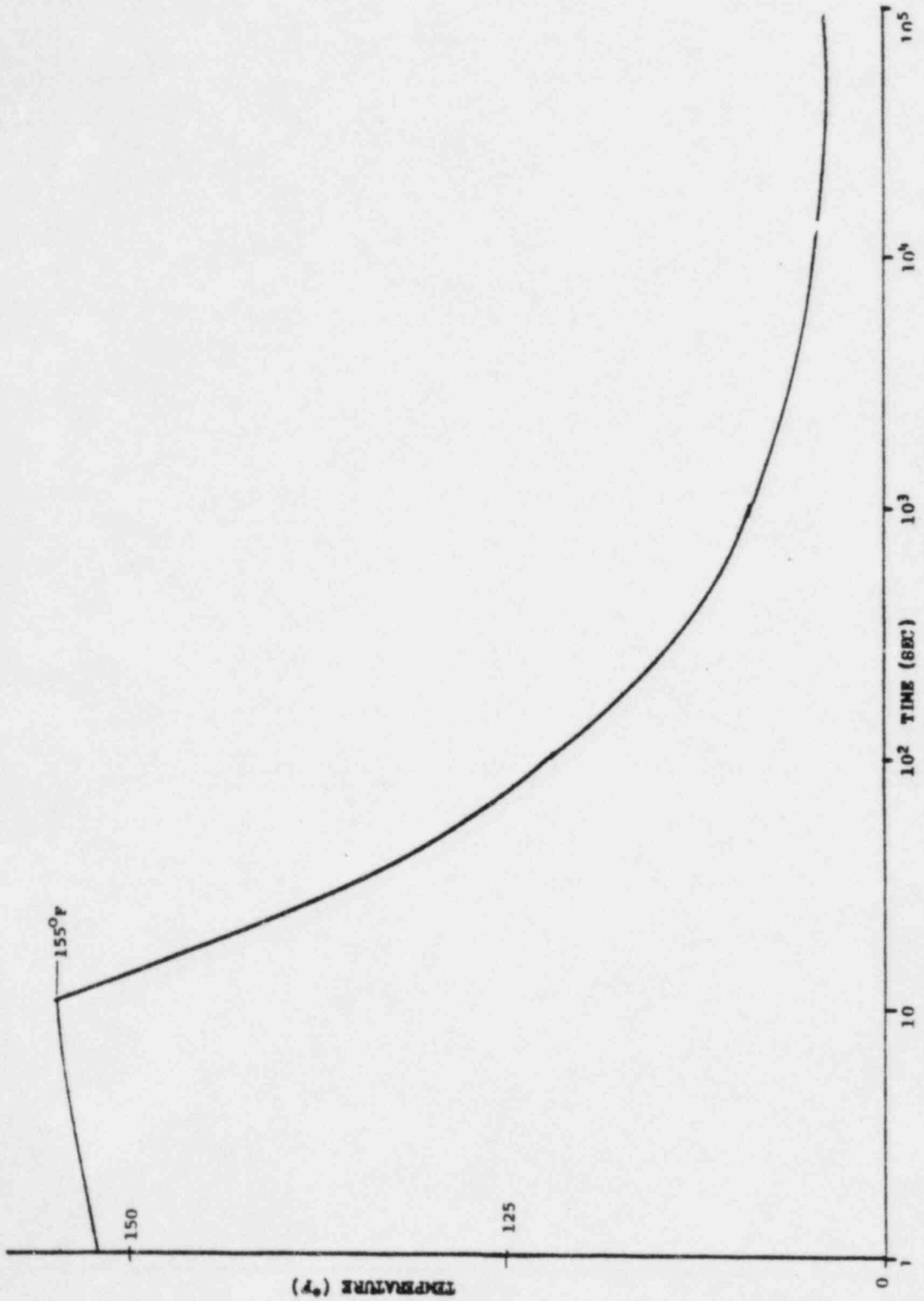



Figure A-6. Turbine Building Temperature vs. Time (El. 54'6") (Licensee Profile 23)

FIGURE SUPPLIED BY THE LICENSEE

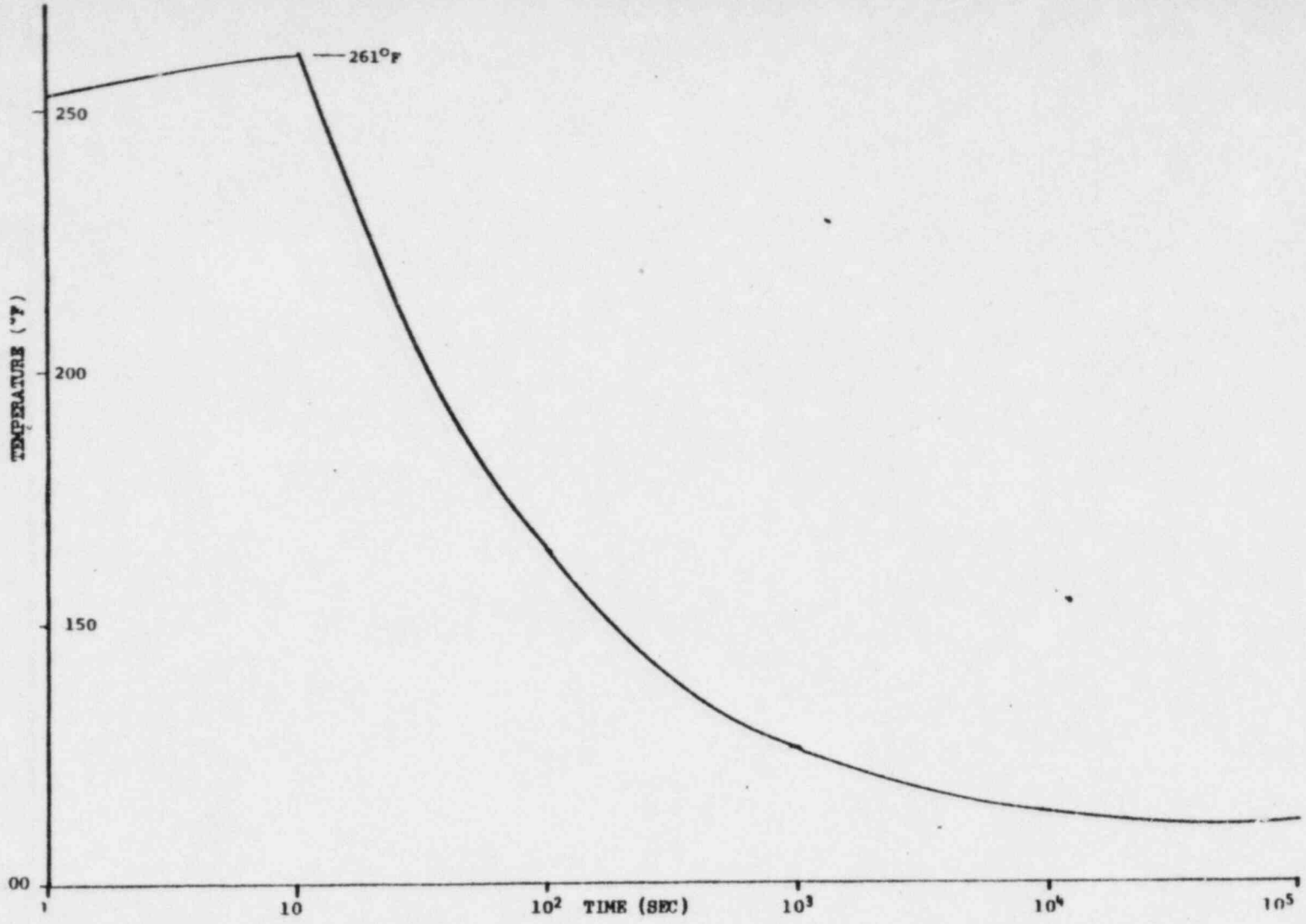



Figure A-7. Auxiliary Building Temperature vs. Time (El. 36'6")
(Licensee Profile 24)

FIGURE SUPPLIED
BY THE LICENSEE

# APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

The following table lists the groupings of safety-related electrical equipment items for the Millstone Point Nuclear Power Station Unit 2. Equipment items provided in the table are used in the detailed equipment environmental qualification evaluation presented in Section 4.4 and summarized in Section 4.2. This table was generated from the lists of equipment provided by the Licensee [1, 8, 11].

The Licensee identified an extensive list of safety-related electrical equipment in various locations of the plant. The equipment listed by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an "equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions (e.g., Flow Transmitter, Fischer & Porter, Model 10B2496, located within containment). This analysis resulted in a reduced listing of equipment (equipment items) that formed the basis for the review. This appendix contains the tabulation of the equipment items, locations, function, plant identification numbers, required operating time, and applicable qualification documentation references.

EQUIPMENT ITEM NO. 1
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 1
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR SI617, SI627, SI637, SI647 (SI617, SI627, SI637, SI647)
SERVICE: HPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 9-B
FUNCTION (PLANT ID): OPERATORS FOR SI616, SI626, SI636, SI646 (SI616, SI626, SI636, SI646)
SERVICE: HPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 8-B
FUNCTION (PLANT ID): OPERATORS FOR SI615, SI625, SI635, SI645 (SI615, SI625, SI635, SI645)
SERVICE: LPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 7-B

EQUIPMENT ITEM NO. 2
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 2
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATORS FOR 2-RB37-2A, 2-RB37-2B (HV6108, HV-6106)
SERVICE: REACTOR COOLANT PUMP OIL COOLING WATER DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 12-B
FUNCTION (PLANT ID): OPERATORS FOR 2-RB30-1A, 2-RB30-1B (HV6096, HV6095)
SERVICE: RBCCW TO REACTOR COOLANT PUMPS
LICENSEE SUBMITTAL: SCEW(S): 11-B

EQUIPMENT ITEM NO. 3
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A3 AND A2
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 3
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATORS FOR SI662, SI663 (SI662, SI663)
SERVICE: SHUTDOWN HEAT EXCHANGER TO HPSI SUCTION
LICENSEE SUBMITTAL: SCEW(S): 15-B

EQUIPMENT ITEM NO. 4
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2 AND A3
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 4
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR SI653, SI654, SI655, SI656 (SI653, SI654, SI655, SI656)
SERVICE: HPSI PUMP DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 13-B

EQUIPMENT ITEM NO. 5
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT, ELEV. 1'6"
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 5
LICENSEE REFERENCE(S): 706
FUNCTION (PLANT ID): OPERATORS FOR SI-651, SI-652 (SI-651, SI-652)
SERVICE: SHUTDOWN COOLING ISOLATION VALVES
LICENSEE SUBMITTAL: SCEW(S): 24-A
FUNCTION (PLANT ID): PRESSURE RELIEF ISOLATION VALVE OPERATORS (RC403, RC405)
SERVICE: PORV BLOCK VALVE
LICENSEE SUBMITTAL: SCEW(S): 1-C

EQUIPMENT ITEM NO. 6
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A-9
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 6
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATOR FOR CH 504 (CH 504)
SERVICE: RADWASTE WATER VALVE TO CHARGING PUMPS HEADER
LICENSEE SUBMITTAL: SCEW(S): 25-D

EQUIPMENT ITEM NO. 7
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A9
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 7
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATOR FOR CH501 (CH 501)
SERVICE: VOLUME CONTROL TANK DISCHARGE VALVE
LICENSEE SUBMITTAL: SCEW(S): 84-B

EQUIPMENT ITEM NO. 8
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A4
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT REQUIRED
TER CHECKSHEET NO. 8
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATORS FOR SI411, SI412 (SI411, SI412)
SERVICE: HPSI PUMP SUCTION
LICENSEE SUBMITTAL: SCEW(S): 16-B

EQUIPMENT ITEM NO. 9
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A18 AND A17
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 9
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATOR FOR CS 4.1A (HV3021)
SERVICE: CONTAINMENT SPRAY STOP VALVE
LICENSEE SUBMITTAL: SCEW(S): 89-B

EQUIPMENT ITEM NO. 10
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST PIPE PENETRATION ROOM, ELEV. 5'0", ZONE A18
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 10
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR CH-429 (HV2524)
SERVICE: CHARGING PUMP DISCHARGE
LICENSEE SUBMITTAL: SCEW(S): 10-B

EQUIPMENT ITEM NO. 11
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 11
LICENSEE REFERENCE(S): 1620, 1064
FUNCTION (PLANT ID): OPERATORS FOR CS 16.1A, 16.1B (HV3008, HV3009)
SERVICE: CONTAINMENT SUMP RECIRCULATION
LICENSEE SUBMITTAL: SCEW(S): 83-B

EQUIPMENT ITEM NO. 12
MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM, ELEV. 38'6", ZONE A50
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR MS-65A (HV4218)
SERVICE: STEAM GENERATOR NO. 1 MAIN STEAM ISOLATION BYPASS
LICENSEE SUBMITTAL: SCEW(S): 17-B
FUNCTION (PLANT ID): OPERATOR FOR MS-201 (HV4191)
SERVICE: STEAM GENERATOR NO. 1 TO AUXILIARY FEEDWATER TURBINE BLDG.
LICENSEE SUBMITTAL: SCEW(S): 18-B
FUNCTION (PLANT ID): OPERATOR FOR MS-65B (HV4222)
SERVICE: STEAM GENERATOR NO. 2 MAIN STEAM ISOLATION BYPASS
LICENSEE SUBMITTAL: SCEW(S): 19-B

EQUIPMENT ITEM NO. 13
MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM, ELEV. 38'6", ZONE A51
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 13
LICENSEE REFERENCE(S): 1064, 695
FUNCTION (PLANT ID): OPERATOR FOR MS-202 (HV4189)
SERVICE: STEAM GENERATOR NO. 2 TO AUXILIARY FEEDWATER TURBINE
LICENSEE SUBMITTAL: SCEW(S): 20-B

EQUIPMENT ITEM NO. 14
MOTORIZED VALVE ACTUATOR LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", ZONE T10
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 14
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): OPERATORS FOR FW-43A, FW-43B (HV5276)
SERVICE: AUXILIARY FEEDWATER ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 14-B

EQUIPMENT ITEM NO. 15
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A-50
ASCO MODEL NP8320A183E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 15
LICENSEE REFERENCE(S): 2850, 649
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-5419, 5421)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 46-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-5420, 5422)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 46-BA

EQUIPMENT ITEM NO. 16
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 8'6"
ASCO MODEL NP8320A185V
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 16
LICENSEE REFERENCE(S): 2850, 649
FUNCTION (PLANT ID): PILOT VALVES FOR CH-518 AND CH-519 (HY-518, HY-519)
SERVICE: CHARGING LINE DISTRIBUTION VALVES
LICENSEE SUBMITTAL: SCEW(S): 14-A
FUNCTION (PLANT ID): PILOT VALVES FOR CH-515, CH-516 (HV-515, HV-516)
SERVICE: LETDOWN SYSTEM CONTAINMENT ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 16-A

EQUIPMENT ITEM NO. 17
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO, MODEL NP8320A177E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 17
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-306)
SERVICE: CONTROL SHUTDOWN COOLING FLOW BYPASS
LICENSEE SUBMITTAL: SCEW(S): 43-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-657)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 47-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-2525)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 52-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY4250, 4251)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 58-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-7690)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 68-BA
FUNCTION (PLANT ID): PILOT VALVE (HY-7312)
SERVICE: NITROGEN STOP VALVE TO SAFETY INJECTION TANKS
LICENSEE SUBMITTAL: SCEW(S): 108-B

EQUIPMENT ITEM NO. 18
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A-18
ASCO MODEL NP8321A5E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 18
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-7311)
SERVICE: PRIMARY MAKEUP WATER TO QUENCH TANK
LICENSEE SUBMITTAL: SCEW(S): 95-B

EQUIPMENT ITEM NO. 18 (CONTINUED)
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-9126)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 68-B
FUNCTION (PLANT ID): PILOT VALVE (HY-9016)
SERVICE: PRIMARY DRAIN TANK DISCHARGE ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 100-B
FUNCTION (PLANT ID): PILOT VALVE (HY-505)
SERVICE: RCP BLEED OFF ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 102-B
FUNCTION (PLANT ID): PILOT VALVE (HY-9150)
SERVICE: CONTAINMENT SUMP ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 110-B

EQUIPMENT ITEM NO. 19
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6" AND 14'6", ZONE A51
ASCO MODEL WPHTX8320A184
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 19
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-4209)
SERVICE: MAIN STEAM HEADER LOW POINT DRAINS
LICENSEE SUBMITTAL: SCEW(S): 66-B

EQUIPMENT ITEM NO. 20
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO MODEL NP8321A6E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 20
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6050)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 56-B

EQUIPMENT ITEM NO. 21
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A50
ASCO MODEL HPX8211B54SW
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 21
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (VARIOUS)
SERVICE: MAIN STEAM ISOLATION TRIP VALVE PILOT OPERATOR
LICENSEE SUBMITTAL: SCEW(S): 40-B

EQUIPMENT ITEM NO. 22
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A-18
ASCO MODEL NP831655E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 22
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6073, 6077)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLED INLET
LICENSEE SUBMITTAL: SCEW(S): 96-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6084)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 97-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6092)
SERVICE: SAMPLE & GAS EFFLUENT FILTER STOP VALVE
LICENSEE SUBMITTAL: SCEW(S): 98-B
FUNCTION (PLANT ID): PILOT VALVE (HY-7083)
SERVICE: CONTAINMENT INSTRUMENT AIR BLOCK VALVE
LICENSEE SUBMITTAL: SCEW(S): 99-B
FUNCTION (PLANT ID): PILOT VALVE (HY-6080, 6088)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 106-B
FUNCTION (PLANT ID): PILOT VALVE (HY-6072, 6075)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER INLET
LICENSEE SUBMITTAL: SCEW(S): 107-B
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HT-4246, 4248)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 50-B

EQUIPMENT ITEM NO. 23
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6"
ASCO MODEL NP831655E
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 23
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-659, HY-660)
SERVICE: SAFETY INJECTION PUMP DISCHARGE BYPASS HEADER
LICENSEE SUBMITTAL: SCEW(S): 94-B

EQUIPMENT ITEM NO. 24
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A51
ASCO MODEL HT8211D4
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 24
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (VARIOUS)
SERVICE: MAIN STEAM ISOLATION TRIP VALVE PLIOT OPERATOR
LICENSEE SUBMITTAL: SCEW(S): 40-BA

EQUIPMENT ITEM NO. 25
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A-2
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 25
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6731)
SERVICE: CONTINUOUS
LICENSEE SUBMITTAL: SCEW(S): 53-B

EQUIPMENT ITEM NO. 26
SOLENOID VALVE LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", ZONE T10
ASCO MODEL HT834481
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 26
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT SOLENOID VALVE (HY-6438, 6439)
SERVICE: TBCCW HEAT INLET ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 72-B

EQUIPMENT ITEM NO. 27
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
ASCO MODEL NP8344 B58V
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 27
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVES FOR EB-91, EB-100 (HV-8380, HV-8378)
SERVICE: HYDROGEN PURGE VALVES
LICENSEE SUBMITTAL: SCEW(S): 21-A

EQUIPMENT ITEM NO. 28
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 8'6"
ASCO MODEL 2003816RF
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 28
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVE FOR CH-517 (HY-517)
SERVICE: AUXILIARY SPRAY
LICENSEE SUBMITTAL: SCEW(S): 15-A

EQUIPMENT ITEM NO. 29
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A50 AND A51
ASCO MODEL NP2063816F
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHFET NO. 29
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PILOT VALVE (PV 4223, PV 4224)
SERVICE: CONTINUOUS #11 #2 ATMOSPHERIC DUMPS
LICENSEE SUBMITTAL: SCEW(S): 35-B

EQUIPMENT ITEM NO. 30
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
ASCO MODEL 2063813RVU
REQUIRED OPERATING TIME: 5 SECONDS
TER CHECKSHEET NO. 30
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): PILOT VALVES FOR EB-88, EB-89 (HV-8150, HV-8151)
SERVICE: CONTAINMENT RADIATION MONITOR ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 17-A
FUNCTION (PLANT ID): PILOT VALVES FOR LRR 43.1, GR-11.1, CH-506, SSP-16.1 (HV-9230, HV-9125, CH 506, HV-9151)
SERVICE: CONTAINMENT ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 19-A
FUNCTION (PLANT ID): PILOT VALVES FOR RC-001, RC-002, RC-003 (HV-1064, HV-1062, HV-1060)
SERVICE: REACTOR COOLANT SAMPLE VALVES
LICENSEE SUBMITTAL: SCEW(S): 20-A
FUNCTION (PLANT ID): PILOT VALVES FOR SI618, SI628, SI638, SI648(HY618, 628, 638, 648)
SERVICE: SAFETY INJECTION TANK TEST AND FILL VALVES
LICENSEE SUBMITTAL: SCEW(S): 25-A

EQUIPMENT ITEM NO. 31
SOLENOID VALVE LOCATED IN THE CONTAINMENT, ELEV. 38'6"
VALCOR MODEL V52660423A V52660433A
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 31
LICENSEE REFERENCE(S): 1834
FUNCTION (PLANT ID): REACTOR HEAD AND PRESSURIZER VENTING (RC-442, 414, 415, 416, 417, 423, 424, 425)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 34A

EQUIPMENT ITEM NO. 32
AMPLIFIER LOCATED IN THE CONTAINMENT, ZONE C-5
UNHOLTZ-DICKIE MODEL 22CAZTR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 32
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS-200, 201, 402, 404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 19-C

EQUIPMENT ITEM NO. 33
ACCELEROMETER LOCATED IN THE CONTAINMENT, ZONE C-5
ENDEVCO MODEL 2273AM20
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 33
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS200, 201, 402, 404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 17-C

EQUIPMENT ITEM NO. 34
RADIATION DETECTOR LOCATED IN THE CONTAINMENT, ELEV. 18'6"
GENERAL ATOMIC MODEL RD23
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 34
LICENSEE REFERENCE(S): 3528
FUNCTION (PLANT ID): ACCIDENT/POST ACCIDENT RADIATION MONITORING (RE 8240, 8241)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 15-C

EQUIPMENT ITEM NO. 35
ELECTRICAL CONNECTOR LOCATED IN VARIOUS LOCATIONS INSIDE CONTAINMENT
IDEAL MODEL 30210/30211
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 35
LICENSEE REFERENCE(S): 905
FUNCTION (PLANT ID): SPLICE ASSEMBLIES
SERVICE: VALVE LIMIT SWITCH CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 13-A

EQUIPMENT ITEM NO. 36
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMPS FLOW (FT-212)
SERVICE: CHARGING PUMP P-18A,B,C
LICENSEE SUBMITTAL: SCEW(S): 6-D

EQUIPMENT ITEM NO. 37
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL 555
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LPSI FLOW MONITORING (FT-312, 322, 332, 342)
SERVICE: LPSI FLOW TO RCS LOOP 1, 2, 3 & 4
LICENSEE SUBMITTAL: SCEW(S): 11-D
FUNCTION (PLANT ID): SHUTDOWN COOLING FLOW MONITORING (FT-306)
SERVICE: SHUTDOWN HEATER EXCHANGE FLOW/LPSI FLOW
LICENSEE SUBMITTAL: SCEW(S): 10-D

EQUIPMENT ITEM NO. 38
RTD LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
ROSEMOUNT MODEL 104ADA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RCS LOOP #1 COLD LEG TEMPERATURE (TE-115)
SERVICE: RCS LOOP COLD LEG
LICENSEE SUBMITTAL: SCEW(S): 4-D
FUNCTION (PLANT ID): RCS LOOP #2 COLD LEG TEMPERATURE (TE-125)
SERVICE: RCS LOOP COLD LEG
LICENSEE SUBMITTAL: SCEW(S): 5-D

EQUIPMENT ITEM NO. 39
RTD LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-9
ROSEMOUNT MODEL 108MB42BB
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN COOLING TEMPERATURE MONITORING (TE-351X,Y)
SERVICE: SHUTDOWN COOLING SYSTEM
LICENSEE SUBMITTAL: SCEW(S): 12-D

EQUIPMENT ITEM NO. 40
RTD LOCATED IN THE CONTAINMENT, ELEV. 38'6", FIRE ZONE C-5
ROSEMOUNT MODEL 104WC88AX
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 40
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER VAPOR PHASE TEMPERATURE (TE-109)
SERVICE: PRESSURIZER VAPOR TEMPERATURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 3-D

EQUIPMENT ITEM NO. 41
ELECTRICAL INDICATOR LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 180
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 41
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): STEAM GENERATOR AUXILIARY FEED PUMP TURBINE SPEED INDICATOR (SI-4194A)
SERVICE: STEAM GENERATOR AUXILIARY FEED PUMP H-21
LICENSEE SUBMITTAL: SCEW(S): 13-D

EQUIPMENT ITEM NO. 42
ELECTRICAL CONDUCTOR MODULES LOCATED IN THE CONTAINMENT
CONAX MODEL N1100132/N1100133
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 42
LICENSEE REFERENCE(S): 2178, 4290
FUNCTION (PLANT ID): PROVIDE A SEALED CABLE ENTRANCE FOR SMLS'S
SERVICE: VALVE LIMIT SWITCHES
LICENSEE SUBMITTAL: SCEW(S): 12-A

EQUIPMENT ITEM NO. 43
ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT, ELEV. 38'6"
LITTON MODEL C1R06V12015S/C1R02V12015P
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 43
LICENSEE REFERENCE(S): 6228
FUNCTION (PLANT ID): ELECTRICAL CONNECTOR (RC414, 415, 416, 417, 422, 423, 424, 425)
SERVICE: RCS VENTING SOLENOID VALVES
LICENSEE SUBMITTAL: SCEW(S): 35A

EQUIPMENT ITEM NO. 44
PRESSURE SWITCH LOCATED IN THE ZONE T11
CUSTOM COMPONENT MODEL CCS604GR6356S
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 44
LICENSEE REFERENCE(S): 3521, 30
FUNCTION (PLANT ID): TURBINE TRIP (PS-4597 A, B, C, D)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 14-C

EQUIPMENT ITEM NO. 45
PRESSURE TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 7'0"
FOXBORO MODEL E11
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 45
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): ESAS & REACTOR PROTECTIVE SYSTEM AND ACCIDENT MONITORING (PT102 A, B, C, D)
SERVICE: PRESSURIZER PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 32A
FUNCTION (PLANT ID): ESAS & REACTOR PROTECTIVE SYSTEM AND ACCIDENT MONITORING (PT-1013 A, B, C, D; PT-1023 A, B, C, D)
SERVICE: STEAM GENERATOR PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 31-A
FUNCTION (PLANT ID): PRESSURIZER HEATER CONTROL ACCIDENT MONITORING (PT-100X, Y)
SERVICE: PRESSURIZER PRESSURE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 27A
FUNCTION (PLANT ID): LOW RANGE PRESSURIZER PRESSURE (PT-103)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 2-C

EQUIPMENT ITEM NO. 46
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17 AND A18
FOXBORO MODEL NE11GM11C1LCF
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 46
LICENSEE REFERENCE(S): 919, 1157, 711
FUNCTION (PLANT ID): WIDE RANGE PRESSURE INDICATION (PT-8238, 8239)
SERVICE: POST ACCIDENT MONITORING
LICENSEE SUBMITTAL: SCEW(S): 121-B

EQUIPMENT ITEM NO. 47
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'10", ZONE A17 AND A18
FOXBORO MODEL E11DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 47
LICENSEE REFERENCE(S): 3525, 1171
FUNCTION (PLANT ID): NOT STATED (PT-8113, 8114, 8115, 8116)
SERVICE: CONTAINMENT PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 91-B

EQUIPMENT ITEM NO. 48
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A51
GE/MAC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): INITIATING SIGNAL FOR STEAM GENERATOR ATMOSPHERIC DUMP (PT-4224)
SERVICE: STEAM GENERATOR PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 36-BA
FUNCTION (PLANT ID): INITIATING SIGNAL FOR STEAM GENERATOR ATMOSPHERIC DUMP (PT-4223)
SERVICE: STEAM GENERATOR PRESSURE
LICENSEE SUBMITTAL: SCEW(S): 36-B

EQUIPMENT ITEM NO. 49
PRESSURE TRANSMITTER LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AUXILIARY FEEDWATER PMP P-9A DISCHARGE HDR. PRESS MONITORING (PT-5289)
SERVICE: AUXILIARY FEED PUMP P-9A
LICENSEE SUBMITTAL: SCEW(S): 17-D
FUNCTION (PLANT ID): AUXILIARY FEED PUMP P-4 DISCHARGE HEADER PRESSURE (PT-5284)
SERVICE: AUXILIARY FEED PUMP P-4
LICENSEE SUBMITTAL: SCEW(S): 16-D
FUNCTION (PLANT ID): AUXILIARY FEED PUMP P-9B DISCHARGE HEADER PRESSURE (PT-5281)
SERVICE: AUXILIARY FEED PUMP P-9B
LICENSEE SUBMITTAL: SCEW(S): 14-D

EQUIPMENT ITEM NO. 50
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-2
GENERAL ELECTRIC MODEL MAC551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LPSI PUMP 1 & 2 HEADER PRESSURE (PT-302X,Y)
SERVICE: LPSI PUMP 1 & 2
LICENSEE SUBMITTAL: SCEW(S): 9-D

EQUIPMENT ITEM NO. 51
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL MAC551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 51
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VOLUME CONTROL TANK PRESSURE (PT-225)
SERVICE: VOLUME CONTROL TANK T-5
LICENSEE SUBMITTAL: SCEW(S): 7-D

EQUIPMENT ITEM NO. 52
PRESSURE TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
FISCHER AND PORTER MODEL 50EP1042BCSA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 52
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER PRESSURE LOW RANGE (PT-103-1)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 1-D

EQUIPMENT ITEM NO. 53
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-3
GENERAL ELECTRIC MODEL 555
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 53
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER SHELL SIDE FLOW MONITORING (FT-6042)
SERVICE: SHUTDOWN HEAT EXCHANGER X23B
LICENSEE SUBMITTAL: SCEW(S): 21-D
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER SHELL SIDE FLOW MONITORING (FT-6043)
SERVICE: SHUTDOWN HEAT EXCHANGER X23A
LICENSEE SUBMITTAL: SCEW(S): 22-D

EQUIPMENT ITEM NO. 54
D/P TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 5'0"
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 54
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): PZR HEATER CONTROL CHARGING PUMP CONTROL ACCIDENT MONITORING (LT-110X, LT-110Y)
SERVICE: PRESSURIZER LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 30-A

EQUIPMENT ITEM NO. 55
D/P TRANSMITTER LOCATED IN THE ZONE A-51
FOXBORO MODEL NE13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 55
LICENSEE REFERENCE(S): 919, 1157, 711
FUNCTION (PLANT ID): AUXILIARY FEED FLOW INDICATION (FT-5277, 5278)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 8-C

EQUIPMENT ITEM NO. 56
D/P TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 14'6"
FOXBORO MODEL E13DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 919, 1171, 1157, 1772
FUNCTION (PLANT ID): INPUT FOR 3 ELEMENT FEEDWATER CONTROL ACCIDENT MONITORING (LT-5274, LT-5272)
SERVICE: STEAM GENERATOR LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 28A
FUNCTION (PLANT ID): RPS INPUT & ACCIDENT MONITORING (LT-1113A, LT-1123A)
SERVICE: STEAM GENERATOR LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 29A

EQUIPMENT ITEM NO. 57
LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 22'6", 15'6"
GEMS MODEL XM548532841500
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMNET SUMP LEVEL INDICATION (LT-8242, 8243)
SERVICE: POST ACCIDENT MONITORING
LICENSEE SUBMITTAL: SCEW(S): 16-C

EQUIPMENT ITEM NO. 58
LEVEL TRANSMITTER LOCATED IN THE TURBINE BUILDING, ELEV. 14'6", FIRE ZONE T-10
GENERAL ELECTRIC MODEL 551
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONDENSATE STORAGE TANK LEVEL MONITORING (LT-5282)
SERVICE: CONDENSATE STORAGE TANK
LICENSEE SUBMITTAL: SCEW(S): 15-D

EQUIPMENT ITEM NO. 59
LEVEL TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", FIRE ZONE A-19
GENERAL ELECTRIC MODEL 555111BCAA3ABA
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VOLUME CONTROL TANK LEVEL MONITORING (LT-226)
SERVICE: VOLUME CONTROL TANK T-5
LICENSEE SUBMITTAL: SCEW(S): 8-D

EQUIPMENT ITEM NO. 60
LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT, ELEV. 3'6", FIRE ZONE C-5
FOXBORO MODEL E13DH
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): 2115
FUNCTION (PLANT ID): PRESSURIZER LEVEL 0-100% (LT-103)
SERVICE: PRESSURIZER LEVEL MONITORING
LICENSEE SUBMITTAL: SCEW(S): 2-D

EQUIPMENT ITEM NO. 61
LEVEL TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 71'0"
FOXBORO MODEL E13DM
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RBCCW SURGE TANK LEVEL MONITORING (LT-6001)
SERVICE: RBCCW SURGE TANK
LICENSEE SUBMITTAL: SCEW(S): 18-D
FUNCTION (PLANT ID): RBCCW SURGE TANK LEVEL MONITORING (LT-6730)
SERVICE: RBCCW SURGE TANK T-3
LICENSEE SUBMITTAL: SCEW(S): 24-D

EQUIPMENT ITEM NO. 62
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", FIRE ZONE A-2
NAMCO MODEL EA17031100
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SHUTDOWN HEAT EXCHANGER BYPASS TO MAIN LPSI HEADER (ZS-657)
SERVICE: SHUTDOWN COOLING FLOW CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 47-BA

EQUIPMENT ITEM NO. 63
LIMIT SWITCH LOCATED IN THE CONTAINMENT
NAMCO MODEL EA180
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): VALVE CONTROL, INTERLOCKS AND POSITION INDICATION (VARIOUS)
SERVICE: VARIOUS AIR OPERATED AND MOTOR OPERATED VALVES
LICENSEE SUBMITTAL: SCEW(S): 10-A

EQUIPMENT ITEM NO. 64
LIMIT SWITCH LOCATED IN THE CONTAINMENT
NAMCO MODEL EA740
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): VALVE CONTROL INTERLOCKS AND POSITION INDICATION (VARIOUS)
SERVICE: VARIOUS AIR OPERATED AND MOTOR OPERATED VALVES
LICENSEE SUBMITTAL: SCEW(S): 11-A

EQUIPMENT ITEM NO. 65
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", LPSI PUMP ROOM, ZONE A2
NAMCO MODEL EA74020100
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-6731)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 54-B

EQUIPMENT ITEM NO. 66
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17
NAMCO MODEL EA74020100
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-4246, 4248)
SERVICE: S/G BLOWDOWN ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 49-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-6050)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 55-B

EQUIPMENT ITEM NO. 67
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING PIPING PENETRATION ROOM, ZONE A-18
NAMCO MODEL EA13011302
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): 2116
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-2525)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 51-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-4250, ZS-4251)
SERVICE: LIMIT SWITCH
LICENSEE SUBMITTAL: SCEW(S): 57-B

EQUIPMENT ITEM NO. 68
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING, ELEV. 5'0", ZONE A17, WEST PIPE PEN. RM
NAMCO MODEL SL3CB2
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION & CONTROL CIRCUITRY (ZS-9126)
SERVICE: WASTE GAS TANK INLET ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 69-B
FUNCTION (PLANT ID): VALVE POSITION INDICATION & CONTROL CIRCUITRY (ZS-7690)
SERVICE: REACTOR COOLANT SAMPLE VALVE
LICENSEE SUBMITTAL: SCEW(S): 69-BA
FUNCTION (PLANT ID): POSITION INDICATION VALVE CONTROL (ZS-6080, -6084, -6088, -6092)
SERVICE: CONTAINMENT AIR RECIRCULATION COOLER CONTROL VALVE
LICENSEE SUBMITTAL: SCEW(S): 112-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-7311)
SERVICE: QUENCH TANK MAKEUP WATER CONTAINMENT ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 113-B

EQUIPMENT ITEM NO. 68 (CONTINUED)
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-7312)
SERVICE: NITROGEN STOP VALVE TO SAFETY INJECTION TANKS
LICENSEE SUBMITTAL: SCEW(S): 116-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-9016)
SERVICE: PRIMARY DRAIN TANK DISCHARGE ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 119-B
FUNCTION (PLANT ID): POSITION INDICATION & VALVE CONTROL (ZS-505)
SERVICE: RCP BLEED OFF ISOLATION VALVE
LICENSEE SUBMITTAL: SCEW(S): 120-B

EQUIPMENT ITEM NO. 69
ELECTRICAL CABLE LOCATED IN THE CONTAINMENT, ZONE C-5
ENDEVCO MODEL 3075M6
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT MONITORING (ZS-200, -201, -402, -404)
SERVICE: PORV DISCHARGE LINE MONITORING
LICENSEE SUBMITTAL: SCEW(S): 18-C

EQUIPMENT ITEM NO. 70
ELECTRICAL CABLE, INSTRUMENT LOCATED OUTSIDE CONTAINMENT
ROCKBESTOS MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): 1155
FUNCTION (PLANT ID): SIGNAL FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 5-B

EQUIPMENT ITEM NO. 71
ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT
ROCKBESTOS MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): 1155
FUNCTION (PLANT ID): SIGNAL FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 6-A

EQUIPMENT ITEM NO. 72
ELECTRICAL CABLE, COAXIAL LOCATED IN THE CONTAINMENT
ROCKBESTOS MODEL RSS6104
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 72
LICENSEE REFERENCE(S): 3247, 52
FUNCTION (PLANT ID): RADIATION MONITORING CABLING (Z1RM8240/B, C - Z2RM8241/B, C)
SERVICE: LOW LEVEL SIGNAL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 37-A

EQUIPMENT ITEM NO. 73
ELECTRICAL CABLE, COAXIAL LOCATED OUTSIDE CONTAINMENT
ROCKBESTOS MODEL RSS6104
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 73
LICENSEE REFERENCE(S): 3247
FUNCTION (PLANT ID): RADIATION MONITORING CABLE (Z1RM8240/B, C - Z2RM8241/B, C)
SERVICE: LOW LEVEL SIGNAL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 122-B

EQUIPMENT ITEM NO. 74
ELECTRICAL CABLE, POWER LOCATED OUTSIDE CONTAINMENT
GENERAL CABLE MODEL EPR/HYPALON
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 74
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): WIREWAYS FOR MEDIUM VOLTAGE MOTORS & POWER SOURCES
SERVICE: 4160 V SYSTEMS
LICENSEE SUBMITTAL: SCEW(S): 2-B

EQUIPMENT ITEM NO. 75
ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT
KERITE MODEL 600V
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 6-AA

EQUIPMENT ITEM NO. 76
ELECTRICAL CABLE, INSTRUMENT LOCATED OUTSIDE CONTAINMENT
KERITE MODEL 600V
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR INSTRUMENTATION CIRCUITS
SERVICE: GENERAL INSTRUMENTATION
LICENSEE SUBMITTAL: SCEW(S): 5-BA

EQUIPMENT ITEM NO. 77
ELECTRICAL CABLE, CONTROL LOCATED OUTSIDE CONTAINMENT
KERITE MODEL FR/FR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 77
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR CONTROL AND LOW LEVEL POWER CIRCUITS
SERVICE: VARIOUS CONTROL AND LOW LEVEL POWER CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 3-B

EQUIPMENT ITEM NO. 78
ELECTRICAL CABLE, CONTROL LOCATED IN THE CONTAINMENT
KERITE MODEL FR/FR
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 78
LICENSEE REFERENCE(S): 820, 6241
FUNCTION (PLANT ID): WIREWAYS FOR CONTROL & LOW LEVEL POWER CIRCUITS
SERVICE: VARIOUS CONTROL AND LOW LEVEL POWER CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 5-A

EQUIPMENT ITEM NO. 79
ELECTRICAL CABLE, POWER LOCATED IN THE CONTAINMENT
ANACONDA WIRE AND CABLE MODEL EPR/CSPE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 79
LICENSEE REFERENCE(S): 1347
FUNCTION (PLANT ID): WIREWAYS FOR LOW VOLTAGE MOTORS, D.C. SYSTEMS, HEATER, ETC.
SERVICE: 480V, 120 VAC, 125 VDC CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 4-A

EQUIPMENT ITEM NO. 80
ELECTRICAL CABLE, POWER LOCATED OUTSIDE CONTAINMENT
ANACONDA WIRE AND CABLE MODEL EPR/CSPE
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): 1347
FUNCTION (PLANT ID): WIREWAYS FOR LOW VOLTAGE MOTORS, D.C. SYSTEMS, HEATERS, ETC.
SERVICE: 480 V, 120 VAC, 125 VDC CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 4-B

EQUIPMENT ITEM NO. 81
ELECTRICAL TERMINATION LOCATED IN THE CONTAINMENT, ZONE C-5
ROSEMOUNT MODEL 104ADA (TE112HC104AFC1)
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 81
LICENSEE REFERENCE(S): 32
FUNCTION (PLANT ID): RCS LOOP TEMPERATURE RTD CABLE TERMINATION (TE112HA-D, TE1122HA-D, TE112CA-D, TE122CA-D)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 5-C

EQUIPMENT ITEM NO. 82
TERMINAL BLOCK LOCATED IN THE CONTAINMENT
WEIDMULLER MODEL TYPE SAK4
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): 3644, 3510
FUNCTION (PLANT ID): TERMINATION OF MONITORING CIRCUITS (T356, T357)
SERVICE: CONTAINMENT SUMP LEVEL MONITORS
LICENSEE SUBMITTAL: SCEW(S): 38-A

EQUIPMENT ITEM NO. 83
TERMINAL BLOCK LOCATED IN THE CONTAINMENT, ELEV. 14'6"
GENERAL ELECTRIC MODEL CR151
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): 3632, 12, 14
FUNCTION (PLANT ID): TO TERMINATE CONNECTIONS TO ELECTRICAL PENETRATIONS
SERVICE: VARIOUS CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 3-A

EQUIPMENT ITEM NO. 84
TERMINAL BLOCK LOCATED IN THE ENCLOSURE BUILDING, ELEV. 14'6", ZONE A25, A26
GENERAL ELECTRIC MODEL CR151
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 84
LICENSEE REFERENCE(S): 3632, 12, 14
FUNCTION (PLANT ID): TO TERMINATE CONNECTIONS TO ELECTRICAL PENETRATIONS
SERVICE: VARIOUS
LICENSEE SUBMITTAL: SCEW(S): 1-B

EQUIPMENT ITEM NO. 85
ELECTRICAL PENETRATION LOCATED IN THE CONTAINMENT, ELEV. 14'6"
CONAX MODEL 785210000
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 85
LICENSEE REFERENCE(S): 3509
FUNCTION (PLANT ID): MAINTAIN ELECTRICAL CONTINUITY THROUGH THE CONT. STRUCTURE (ED3, ED8, ED9, WD3, WD8, WD9)
SERVICE: VARIOUS INSTRUMENTATION CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 36A
FUNCTION (PLANT ID): MAINTAIN ELECTRICAL CONTINUITY THROUGH THE CONT. STRUCTURE (EB2, WB2, EB4, EC1, EC3, WC3, WC5)
SERVICE: VARIOUS LOW VOLTAGE POWER & CONTROL CIRCUITS
LICENSEE SUBMITTAL: SCEW(S): 2-A

EQUIPMENT ITEM NO. 86
HYDROGEN RECOMBINER LOCATED IN THE CONTAINMENT, ELEV. 14'6" (H-29A), ELEV. 38'6" (H-29B)
WESTINGHOUSE, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 86
LICENSEE REFERENCE(S): 1571 THROUGH 1578, 15
FUNCTION (PLANT ID): TO LIMIT HYDROGEN EXISTING IN THE CONTAINMENT (H-29A, H-29B)
SERVICE: NOT STATED
LICENSEE SUBMITTAL: SCEW(S): 7-A

EQUIPMENT ITEM NO. 87
MOTOR CONTROL CENTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 36'6", ZONE A49
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 87
LICENSEE REFERENCE(S): 3518
FUNCTION (PLANT ID): SUPPLIES POWER TO ELECTRICAL LOADS (B52)
SERVICE: 480V
LICENSEE SUBMITTAL: SCEW(S): 30B

EQUIPMENT ITEM NO. 88
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): 3513, 27
FUNCTION (PLANT ID): DEVELOPMENT CONTAINMENT SPRAY (P-43A, P-43B)
SERVICE: CONTAINMENT SPRAY
LICENSEE SUBMITTAL: SCEW(S): 21-B

EQUIPMENT ITEM NO. 89
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
JOY MANUFACTURING MODEL 382651170
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 89
LICENSEE REFERENCE(S): 1559
FUNCTION (PLANT ID): FAN DRIVE (F-15A, F-15B)
SERVICE: ENGINEERING SAFEGUARD ROOM AIR RECIRCULATION FAN
LICENSEE SUBMITTAL: SCEW(S): 23-B

EQUIPMENT ITEM NO. 90
ELECTRIC MOTOR LOCATED IN THE ELEV. 45'6", ZONE A2, A4, A5
SIEMANS-ALLIS, MODEL NOT STATED
REQUIRED OPERATING TIME: 180 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): 3514, 3515
FUNCTION (PLANT ID): PUMP DRIVE (P-41A, P-41B, P-41C)
SERVICE: HIGH PRESSURE SAFETY INJECTION
LICENSEE SUBMITTAL: SCEW(S): 25-B

EQUIPMENT ITEM NO. 91
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 45'6", ZONE A2, A3
SIEMANS-ALLIS, MODEL NOT STATED
REQUIRED OPERATING TIME: 6 HOURS
TER CHECKSHEET NO. 91
LICENSEE REFERENCE(S): 3514, 3515
FUNCTION (PLANT ID): PUMP DRIVE (P-42A, P-42B)
SERVICE: LOW PRESSURE SAFETY INJECTION
LICENSEE SUBMITTAL: SCEW(S): 26-B

EQUIPMENT ITEM NO. 92
ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, ELEV. 14'6"
JOY MANUFACTURING MODEL 241753500
REQUIRED OPERATING TIME: CONTINUOUS
TER CHECKSHEET NO. 92
LICENSEE REFERENCE(S): 1803
FUNCTION (PLANT ID): CONTAINMENT AIR MIXING (F-18A, F-18B)
SERVICE: POST INCIDENT RECIRCULATION - 460 V
LICENSEE SUBMITTAL: SCEW(S): 9-A

EQUIPMENT ITEM NO. 93
ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, ELEV. 2'0", 36'0"
WESTINGHOUSE MODEL 7189007
REQUIRED OPERATING TIME: 8 DAYS
TER CHECKSHEET NO. 93
LICENSEE REFERENCE(S): 606
FUNCTION (PLANT ID): COOL CONTAINMENT AIR (F-14A, F-14B, F-14C, F-14D)
SERVICE: CONTAINMENT AIR RECIRCULATION SYSTEM - 460 V
LICENSEE SUBMITTAL: SCEW(S): 8-A

EQUIPMENT ITEM NO. 94
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, ELEV. 25'6", ZONE A9
WESTINGHOUSE MODEL TCDP
REQUIRED OPERATING TIME: 2 HOURS
TER CHECKSHEET NO. 94
LICENSEE REFERENCE(S): 3522
FUNCTION (PLANT ID): PUMP DRIVE (P18A, P18B, P18C)
SERVICE: CHARGING PUMPS
LICENSEE SUBMITTAL: SCEW(S): 85-B

EQUIPMENT ITEM NO. 95
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT, ELEV. 1'6"
LIMITORQUE, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 95
LICENSEE REFERENCE(S): 706
FUNCTION (PLANT ID): OPERATORS FOR SI-614, SI-624, SI-634, SI-644 (SI-614, SI-624, SI-634, SI-644)
SERVICE: SAFETY INJECTION TANK ISOLATION
LICENSEE SUBMITTAL: SCEW(S): 23-A

# APPENDIX C - PLANT SAFETY-RELATED SYSTEMS AND DISPLAY INSTRUMENTATION

## C.1 LIST OF SAFETY-RELATED SYSTEMS

In accordance with IE Bulletin 79-01B or NUREG-0588, the Licensee was required to (1) establish a list of systems and equipment required to mitigate the consequences of a loss-of-coolant accident (LOCA) and a high energy line break (HELB) and (2) identify components needed to perform the functions of safety-related display information, post-accident sampling and monitoring, and radiation monitoring.

The list of safety-related systems provided by the Licensee was reviewed by the NRC staff against a staff-developed master list. The NRC staff had developed a generic master list based upon a review of plant safety analyses and emergency procedures. The systems list was established on the basis of the functions that must be performed for accident mitigation (without regard to location of equipment relative to hostile environments). The instrumentation selected included that needed to monitor overall plant performance as well as to monitor the performance of systems on the list.

Based upon information in the Licensee's submittal, the equipment location references, and in some cases conversations with the Licensee, the NRC staff verified that the systems included in the Licensee's submittal were those required to achieve or support: (1) emergency reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the surrounding environment. With the exception of items deferred for later review (cold-shutdown equipment and TMI Lessons-Learned modifications), the staff concluded that the systems identified by the Licensee were acceptable. The list of systems identified by the Licensee and accepted by the NRC staff is as follows:

## SAFETY-RELATED SYSTEMS LIST[1]

| Function | System |
|---|---|
| Emergency Reactor Shutdown | Reactor Coolant<br>Reactor Protection<br>Safeguards Actuation[2]<br>Chemical and Volume Control<br>Control Element Assemblies |
| Containment Isolation | Safety Injection and Containment Spray<br>Containment Radiation Monitoring<br>Chemical and Volume Control<br>Clean Liquid Radwaste<br>Gaseous Radwaste<br>Steam Generator Blowdown<br>Waste Gas<br>Containment Sump<br>Primary Makeup<br>Reactor Coolant Pump Bleedoff<br>Instrument Air<br>Main Steam<br>Feedwater<br>Auxiliary Feedwater<br>Reactor Coolant Sample<br>Nitrogen to SI Tanks<br>Gas and Aerated Liquid Radwaste |
| Reactor Core Cooling | Safety Injection and Containment Spray (HPSI, LPSI, SI Tanks) |
| Containment Heat Removal | Containment Spray<br>Containment Sump Recirculation<br>Reactor Building Closed Cooling Water<br>Containment and Encl Building Ventilation |
| Core Residual Heat Removal | Main Steam<br>Steam Dump<br>Auxiliary Feedwater<br>Feedwater<br>Service Water<br>Shutdown Cooling |

1. The NRC staff recognized that there are differences in nomenclature of systems because of plant vintage and engineering design; consequently, some systems performing identical or similar functions may have different names. In those instances it was necessary to verify the system(s) function with the responsible IE regional reviewer and/or the licensee.
2. Components contained in several systems.

| Function | System |
|---|---|
| Prevention of Significant Release of Radioactive Material to Environment | Containment Radiation Monitoring<br>$H_2$ and $O_2$ Analyzer<br>$H_2$ Recombiners<br>Sampling<br>Post Accident Monitoring |
| Supporting Systems | Emergency Power (125 VCD, 120 VAC, 480V Load Centers, etc.)<br>Auxiliary HVAC System<br>Diesel Generator<br>Boric Acid Heat Tracing<br>Engineered Safeguards Room Air Recirculation<br>Auxiliary Building Ventilation |

SAFETY-RELATED DISPLAY INSTRUMENTATION LIST

1. Pressurizer Pressure
2. Pressurizer Level
3. Pressurizer Temperature
4. Pressurizer Relief Valve Monitors
5. Pressurizer Relief Valve Temperature
6. Quench Tank Pressure
7. Quench Tank Temperature
8. Quench Tank Level
9. RCP Loop Pressure Differential
10. RCP Loop Temperature
11. Steam Generator Pressure
12. Steam Generator Level
13. Auxiliary Feedwater Flow
14. Condensate Storage Tank Level
15. HPSI Pressure
16. LPSI Pressure
17. Containment Spray Pressure
18. HPSI Flow
19. LPSI Flow
20. Containment Spray Flow
21. SI Tank Pressure
22. SI Tank Level
23. SI Tank Recirculation Flow
24. Volume Control Tank Pressure
25. Volume Control Tank and Letdown Temperature
26. Volume Control Tank Level

SAFETY-RELATED DISPLAY INSTRUMENTATION LIST (Cont.)

27. Boric Acid Tank Level
28. Boric Acid Tank Pressure
29. Charging Pressure
30 Charging Flow
31. Charging Temperature
32. Shutdown Cooling Temperature
33. RWST Level
34. RBCCW Flow
35. Containment Pressure
36. Containment Temperature
37. Containment Humidity
38. Containment Sump Level
39. Containment High Range Radiation Detectors

## C.2 SAFETY-RELATED INSTRUMENTATION

In Section 3.1 of the NRC SER dated May 27, 1981 [10], the NRC made the following statement:

> "Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was identified by the licensee and is also presented in Appendix D. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures appears to have been provided. Instrumentation which is not considered to be safety-related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review."

In Reference 11, the Licensee provided the following response:

> "Appendix D to Reference (44) constituted the Staff's interpretation of a safety-related systems list, and included a safety-related display instrumentation list. NNECO has previously provided the basis for this list for Millstone Unit No. 2 by providing Appendix I to Reference (32), the Master Listing of Electrical Components by System.
>
> During the July 7 - 10 meeting, the Staff verbally requested that the list of safety-related display instruments be segregated into two groups. The first group would be the minimum of instruments required to achieve safe shutdown; these therefore require environmental qualification. This listing is provided on the attached sheet, which also

indicates the SCEW sheet number associated with that instrument [see Table C-1 of this TER]. The second listing addresses those safety-related instruments which are exempt from qualification for the reasons provided [see Table C-2 of this TER]."

Evaluation

The Licensee has provided information which provides a technical basis for exempting the instruments of List 2 from qualification with the following exceptions:

- o Charging Flow
- o RBCCW Flow
- o HPSI Flow
- o LPSI Flow
- o Containment Spray Flow.

These instruments are essential to the operator's ability to monitor the post-accident performance of ESF systems. Interpretation of motor current and verifying valve alignment as measures of system performance are not adequate substitutes for system flow indication. These flow instruments should be qualified for their post-accident environment.

Table C-1. Safety-Related Display Instrumentation - Requires Environmental Qualification

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

MILLSTONE UNIT 2

SAFETY-RELATED DISPLAY INSTRUMENTATION

LIST 1 - Requires Environmental Qualification

| | Parameter | SCEWS |
|---|---|---|
| 1. | Pressurizer Pressure | 27-A, 32-A |
| 2. | Pressurizer Level | 30-A |
| 3. | Pressurizer Relief Valve Monitors | 17-C, 18-C, 19-C, 20-C |
| 4. | RCP Loop Temperature | 5-C |
| 5. | Steam Generator Pressure | 31-A |
| 6. | Steam Generator Level | 28-A, 29-A, 9-C |
| 7. | Auxiliary Feedwater Flow | 8-C |
| 8. | Containment Pressure | 121-B |
| 9. | Containment Sump Level | 16-C |
| 10. | Containment High Range Radiation Detectors | 15-C |

FIGURE SUPPLIED BY THE LICENSEE

Table C-2. Safety-Related Display Instrumentation - Exempt from Environmental Qualification

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

MILLSTONE UNIT 2

SAFETY-RELATED DISPLAY INSTRUMENTATION

LIST 2 - Exempt from Environmental Qualification

| Parameter | Exemption Justification |
|---|---|
| SI Tank Pressure<br>SI Tank Level<br>SI Tank Recirc Flow | The SI Tank System is passive in nature and completes its function early into the DBE (LOCA). Instrumentation is utilized during normal operations and would not be relied upon during the accident. |
| Volume Control Tank Pressure<br>Volume Control Tank Temperature<br>Volume Control Tank Level<br>Let Down Ht Exchanger Temperature | The VCT and Let Down Systems are isolated from the Reactor Coolant System in the event of an accident (by SIAS and CIAS). This instrumentation is utilized during normal operation and would not be relied upon during the accident. |
| Charging Pressure<br>Charging Flow<br>Charging Temperature | The Charging pumps are positive displacement pumps. When pumps are in operation, header pressure will be equal to RCS pressure which is determined utilizing qualified instrumentation. Flow is determined by number of running charging pumps during the accident. Charging temperature is utilized during normal operations as are pressure and flow, and would not be relied upon during the accident. |
| Pressurizer Temperature | The pressurizer temperature instrumentation is utilized during normal operations and would not be relied upon during the accident. |
| Pressure Relief Valve Temperature | The pressurizer relief valve temperature sensors would not be relied upon during the accident. The qualified acoustic valve monitoring system will provide indications on an open relief valve with more assurance than the temperature elements. |

FIGURE SUPPLIED BY THE LICENSEE

Table C-2 (Cont.)

| Parameter | Exemption Justification |
|---|---|
| Quench Tank Pressure<br>Quench Tank Temperature<br>Quench Tank Level | The Quench Tank instrumentation is utilized during normal operations and would not be relied upon during the accident. This instrumentation would be of limited use in the event of an accident as the rupture disk is rated to release at 100 pounds. Leakage past the relief valves would be detected by the acoustic valve monitoring system during a small break scenario, and the Quench Tank is not used in large break scenarios. |
| RBCCW Flow | Proper valve alignment and pump operation verify adequate flow in the RBCCW System. Excessive flow would be noted by the pump motor current indication which is not located in a harsh environment. |
| RCS Differential Pressure | RCS Differential Pressure indication is only used during normal plant operation. During the postulated accident the reactor coolant pumps are secured and RCS differential pressure indication would serve no function. |
| Containment Temperature<br>Containment Humidity | Containment Temperature and Humidity indication is used during normal operation and is not required during the postulated accident. |
| Shutdown Cooling Temperature | Verification of Shut Down Cooling System operation would be accomplished by trending qualified RCS temperature indication. |
| HPSI Pressure<br>LPSI Pressure<br>Containment Spray Pressure<br><br>HPSI Flow<br>LPSI Flow<br>Containment Spray Flow | HPSI, LPSI and containment spray pressure and flow indication can be verified by proper valve alignment and pump operation. Excessive or insufficient motor current, can be interpreted by the operator to determine the condition of the system. |

FIGURE SUPPLIED
BY THE LICENSEE

# APPENDIX D - REVIEW OF LICENSEE'S RESPONSE TO NRC EEQ SER CONCERNING JUSTIFICATION FOR INTERIM OPERATION

## 1. BACKGROUND

The NRC Safety Evaluation Report (SER) concerning equipment environmental qualification (EEQ) states [10]:

> "Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC EEQ SERs. The results of the meeting were as follows: (1) FRC was requested to proceed immediately with the technical review of licensees' justification for interim operation, (2) the format was established, and (3) the criteria for the review were established. These criteria are presented in Section 2 of this appendix.

On January 21, 1982, the NRC provided the following modification to Final Assignment 13 concerning this subject:

> "The FRC review will consist of:
>
> - Review the licensee's justification of interim operation and provide FRC independent analysis which shows whether or not licensee provided technically sound rationale as a basis for justification for continued plant operation.

- On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the lists, FRC may provide any additional information which in FRC's judgment is necessary to support the conclusions regarding justification for continued operation."

On January 25, 1982, the NRC was provided with the completed review of the licensees' statements presented as a basis for justification for interim operation in response to the NRC EEQ SER.* On February 5, 1982, at the NRC's request, the NRC was provided with actual examples of licensees' responses to the NRC EEQ SER that provide adequate rationale as a basis for justification for interim operation.**

## 2. GENERAL DISCUSSION

In general, licensee-submitted justifications for interim operation are based on systems considerations, equipment operability evaluations, or failure-modes-and-effects analyses.

Systems considerations often involve the availability of backup equipment capable of performing the particular safety function of concern. The backup equipment is either environmentally qualified, unqualified but not exposed to a harsh environment at the same time as the primary equipment, or located so that it is unlikely that both the primary and backup equipment would be simultaneously exposed to a severe environment. In general, these systems discussions should consider (1) the possibility of a single-active failure

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* C. J. Crane
Letter to R. A. Clark, NRC. Subject: Transmittal of FRC Review of Licensees' Responses to NRC EEQ SER Concerning Justification for Interim Operation
FRC, 25-Jan-82

** C. J. Crane
Letter to R. A. Clark, NRC. Subject: Transmittal of Actual Examples of Licensees' Responses to NRC EEQ SER Which Provide Adequate Rationale as a Basis for Justification of Interim Operation
FRC, 5-Feb-82

disabling the backup equipment, (2) any major differences in the characteristics of the primary and backup equipment (unless it is obvious that the equipment is essentially identical), (3) the possibility of electrical failure of the primary equipment causing an adverse effect on other safety-related equipment or power supplies, and (4) in the case of display instrumentation, the possibility of an operator being misled by the failed primary equipment. Where equipment has not been demonstrated to be qualified, some justifications discuss administrative procedures or revised operating procedures in effect. Depending upon the specific equipment involved, each of the above considerations need not be discussed in every instance, but, in general, a complete systems discussion would consider the above points.

Where equipment qualification evaluations were used, licensees generally (1) received additional information from manufacturers, (2) applied engineering judgment, (3) performed material analysis, and/or (4) used partial test data in support of the original qualification documentation. Where these evaluations were performed, the licensees determined that, although full qualification was not documented, there was sufficient evidence to suggest that the equipment would perform its intended safety function, thereby justifying interim operation until qualified equipment is installed.

Some licensees provided detailed failure-modes-and-effects analyses of electrical circuitry to demonstrate that, under all identified failure modes, the safety function of the equipment could still be accomplished.

Other justifications involved a combination of qualification information and systems information. For example, if a licensee has qualification information (such as a generic test report or other partial qualification documentation) that tends to confirm the ability of the equipment to remain operable for a specified period of time, justification for interim operation often was based upon a discussion of the required safety function being performed prior to the potential failure. This type of discussion often applies to equipment which performs a short-term trip or isolation function in the early stages of an accident.

3. PLANT-SPECIFIC REVIEW

As a result of the review, this plant was evaluated and the results documented on the "Summary of Review of Licensee's 90-Day Response" form reproduced below:

"EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)
Review of Licensees' Resolution of Outstanding Issues
From NRC Equipment Environmental Qualification
Safety Evaluation Reports

SUMMARY OF REVIEW
OF LICENSEE 90-DAY RESPONSE

Utility: Northeast Nuclear Energy Company
Plant Name: Millstone Unit 2
NRC Docket No. 50-336
NRC TAC No. 42493
NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 467

References:

a. W. G. Counsil
Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification of Electrical Equipment, Millstone Nuclear Power Station, Unit No. 2
Northeast Utilities, 26-Aug-81
A01740

b. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Millstone Unit 2
Environmental Qualification of Safety-Related Electrical Equipment
NRC, 27-May-81

The Licensee has submitted technical information in Reference a in response to the NRC SER [b] on environmental qualification. FRC has reviewed these documents [a, b]. As a result of this review, FRC concludes that the Licensee has stated that the equipment items are environmentally qualified; or has provided a technically sound rationale as a basis for justification for continued plant operation; or has provided a technically sound rationale or other additional information which in FRC's judgment provides a basis for justification for continued operation; with the following exceptions:

| Equipment Item | Equipment Description/ Function | SCEW Sheet No. | Status Code | Basis for Deficiency |
|---|---|---|---|---|

None

In general, the Licensee's response to the SER addressed and provided resolution of deficiencies identified in the SER and provided adequate rationale as a basis for justification for interim operation."

# APPENDIX E - REQUEST FOR ADDITIONAL INFORMATION

This appendix contains the Request for Additional Information (RAI) that was developed during the course of the review and issued to the NRC for forwarding to the Licensee. The RAI was revised throughout the review to reflect the Licensee's response(s) to the initial RAI.

The reader is cautioned that the numbers in brackets refer to citations found in the list of references at the end of this appendix and not to the citations listed in Section 6, References, of the TER.

REQUEST FOR ADDITIONAL INFORMATION

EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)
REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES
FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY
EVALUATION REPORTS (SER) AND TMI ACTION PLAN INSTALLED EQUIPMENT

Northeast Nuclear Energy Company

Millstone Unit 2

NRC Docket No. 50-336

November 11, 1981

NRC TAC No. 42493

Rev. 1, February 26, 1982
Rev. 2, May 17, 1982

## BACKGROUND

Franklin Research Center (FRC) of Philadelphia, Pa. is providing assistance to the U.S. Nuclear Regulatory Commission (NRC) for the equipment environmental qualification (EEQ) review of operating reactors. FRC will perform an EEQ review of the Licensee's 90-day response to outstanding issues from the NRC Equipment Environmental Qualification Safety Evaluation Report (SER) and the installed TMI Action Plan equipment. The review will be limited to safety-related equipment potentially exposed to a harsh environment. The results will be presented in the form of a technical evaluation report for each plant.

This request for additional information (RAI) is the result of an evaluation of the information provided by letters dated August 26, 1981 [1] and January 30, 1981 [2].*

In response to the FRC request for information, the Licensee, on February 17, 1982 [5], transmitted most of the information requested. The following RAI items remain to be addressed by the Licensee: A.1.f, A.1.k, A.1.l, A.1.o, A.1.ee, and Section B.(1)**

By letter dated October 20, 1981 [8], the Licensee advised NRC that a particular cable was not qualified.(2)

The following additional qualification documentation was submitted by the Licensee:(1)

1. Technical information concerning NUREG-0578, etc. [6](1)
2. Technical information concerning NUREG-0737, etc. [7](1)
3. Report of test on seismic vibration testing of two NAMCO limit switches, etc., 04 May 1979(1)
4. Report of test on SMB-0-25 etc., 23 Sept. 1970(1)

*Numbers in brackets refer to citations found in the list of references.
**Throughout the text, superscript numbers in parentheses indicate the revision in which the underlined material preceding the superscript was added.

5. Z. A. Tendor
Engineering Data: Grease Lubrication of Electric Motor Bearings
Westinghouse, 01, May 1976
LB75-1(1)

6. R. J. DeRosa
Letter to C. Dexter, Gaulin Corp. Subject: Millstone Unit No. 2, Environmental Qualifcation of Electrical Equipment (Charging Pumps F18C)
Northeast Utilities, 03 June 1980
GEE-80-393(1)

7. J. A. Malone
Letter to R. J. DeRosa, Northeast Utilities. Subject: Millstone Unit No. 2 Environmental Qualification of Electrical Equipment, with Attachment
Gaulin Corp., June 1980(1)

8. J. F. Stolz
Letter to T. M. Anderson, Westinghouse. Subject: Evaluation of WCAP-7709L, Supplements 5, 6, and 7
USNRC, 22 June 1978(1)

9. R. J. DeRosa
Letter to O. A. Berquist, General Electric: Subject: Millstone Unit No. 2 Electrical Penetration Terminal Blocks
Northeast Utilities, 03 Aug. 1979
GEE-79-459, Proprietary(1)

10. O. A. Berquist
Letter to R. J. DeRosa, Northeast Utilities. Subject: Millstone Unit No. 2 Electrical Penetration Terminal Blocks
General Electric, 24 July 1979
Properietary(1)

11. G. R. Dietz
Letter to J. R. Marth, Cerro Wire & Cable. Subject: Summary of Parameters Pertinent to the Irradiation of a Mandrel of Cable Samples
Isomedix, 19 Aug. 1975(1)

12. R. J. DeRosa
Letter to O. A. Berquist, General Electric. Subject: Millstone Unit No. 2 Electrical Penetration Terminal Blocks
Northeast Utilities, 14 June 1979
GEE-79-365, Proprietary(1)

A. FRC REVIEW OF THE LICENSEE'S 90-DAY RESPONSE TO THE NRC EEQ SER

| | INFORMATION REQUESTED | DATE RECEIVED BY FRC*** |
|---|---|---|
| 1. | In reference to the Licensee's 90-day response [1] to the NRC SER [3], a legible single copy of each of the following qualification documents is requested in order that the FRC evaluation may proceed: | |
| | a. Conax IPS-556.2 (SCEWS 2A) [1] | 2/17/82 [5](1) |
| | b. GE letter, G-EH-8-16, dated 2-2-78 (SCEWS 3A) [1] | 2/17/82 [5](1) |
| | c. GE letter, G-EH-9-1-141, dated 10-18-79 (SCEWS 3A) [1] | 2/17/82 [5](1) |
| | d. GE letter, R. F. Thibault to R. DeRosa, dated 12-14-79, on terminal block LOCA test (SCEWS 3A) [1] | 2/17/82 [5](1) |
| | e. Kerite Engineering memo, 178A, dated May 1, 1979 (SCEWS 5A) [1] | 2/17/82 [5](1) |
| | f. Cerro certified report, dated 2-1-77 (SCEWS 6A) [1] | |
| | g. Westinghouse letter, NEU-3546, dated Oct. 1, 1980 (SCEWS 7A) [1] | 2/17/82 [5](1) |
| | h. Vendor qualification report, plant file MRIR #1-26-79 (SCEWS 10A) [1] | 2/17/82 [5](1) |
| | i. NUSCO memoranda GEE-79-214, GEE-78-358, GEE-79-271 (SCEWS 13A) [1] | 2/17/82 [5](1) |
| | j. ASCO test report, No. AQS21678/TR Rev. B (SCEWS 14A) [1] | 2/17/82 [5](1) |

***This column will be completed by FRC as the requested information is received.

DATE RECEIVED BY FRC***

| | | |
|---|---|---|
| k. | R. K. McCarthy letter to file, dated 9-29-80, GEE-80-710 (SCEWS 20A) [1] | |
| l. | Foxboro test report, T3-1013-MCA (SCEWS 28A) [1] | |
| m. | Conax qualification test report, IPS-556.1 (SCEWS 36A) [1] | 2/17/82 [5](1) |
| n. | Rockbestos report, "Qualification of Firewall III Coaxial Constructions," dated January 18, 1978 (SCEWS 37A) [1] | 2/17/82 [5](1) |
| o. | Isomedix test report, dated Dec. 27, 1977 (SCEWS 37A) [1] | |
| p. | Weidmuller letter, dated June 10, 1980 (SCEWS 38A) [1] | 2/17/82 [5](1) |
| q. | GE letter, O. A. Berquist to R. J. DeRosa, dated 9-22-80 (SCEWS 21B) [1] | 2/17/82 [5](1) |
| r. | NUSCO memo, R. J. DeRosa to file GEE-80-746, dated 10-10-80 (SCEWS 21B) [1] | 2/17/82 [5](1) |
| s. | GE topical report, IEEE 323, dated Dec. 1978 (SCEWS 21B) [1] | 2/17/82 [5](1) |
| t. | Siemans-Allis interoffice correspondence, dated Oct. 8, 1980, revised Oct. 16, 1980 (SCEWS 25B) [1] | 2/17/82 [5](1) |
| u. | Wyle test report, 17436-2 Rev. A, dated 2-27-81 (SCEWS 25B) [1] | 2/17/82 [5](1) |
| v. | GE letter, O. A. Berquist to R. J. DeRosa, dated Oct. 10, 1980, on RBCCW pump motors (SCEWS 29B) [1] | 2/17/82 [5](1) |

| | | DATE RECEIVED BY FRC*** |
|---|---|---|
| w. | GE letter, O. A. Berquist to R. J. DeRosa, dated Nov. 15, 1979, on containment spray pump motors (SCEWS 29B) [1] | 2/17/82 [5](1) |
| x. | Wyle Laboratories NEQ Test Report 43757-2,(1) Sept. 27, 1978 (SCEWS 30B) [1] | 2/17/82 [5](1) |
| y. | Wyle Laboratories NEQ Test Report 43757-2, Sept. 27, 1978 (SCEWS 31B) [1] | 2/17/82 [5](1) |
| z. | GE instruction 198-4532K11-001A (SCEWS 36Ba) [1] | 2/17/82 [5](1) |
| aa. | Custom Control Centers letter, Theryn Eckstein to R. K. McCarthy, dated 10-13-80 (SCEWS 67B) [1] | 2/17/82 [5](1) |
| bb. | Custom Component Switches, Inc., Test Report QTR 604-01 (SCEWS 67B) [1] | 2/17/82 [5](1) |
| cc. | Limitorque Test Report 600198 Addendum #1 (SCEWS 83B) [1] | 2/17/82 [5](1) |
| dd. | Westinghouse test report, "Qualification of Westinghouse Medium Motor and Gearing Div. Class IE Motors," WCAP-9112 (SCEWS 85B) [1] | 2/17/82 [5](1) |
| ee. | Operating and Maintenance Instructions Reciprocating and Charging Pump NP18-3.1TFS (SCEWS 85B) [1] | |
| ff. | Foxboro test report T2-1075 (SCEWS 91B) [1] | 2/17/82 [5](1) |
| gg. | Foxboro test report T2-6061 (SCEWS 121B) [1] | 2/17/82 [5](1) |
| hh. | Rosemount Engineering letter, from J. Graham to R. K. McCarthy, dated 8-27-79 (SCEWS 5C) [1] | 2/17/82 [5](1) |

| | DATE RECEIVED BY FRC*** |
|---|---|
| ii. General Atomic test report, Class IE Testing of Analog High Range Radiation Monitor, E-254-960 (SCEWS 15C) [1] | 2/17/82 [5](1) |
| jj. Babcock & Wilcox, valve monitoring system, test program 3-21-80 (SCEWS 17C) [1] | 2/17/82 [5](1) |
| kk. W. G. Counsil, letter to H. R. Denton (NRC), dated 12/31/79 (SCEWS 10D) [1] | 2/17/82 [5](1) |

B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

| INFORMATION REQUESTED | DATE RECEIVED BY FRC*** |
|---|---|

1. References 2 and 6 do(1) not provide adequate detail with respect to identification of TMI Action Plan equipment installed as of 1/1/81.

   a. Identification of all TMI Action Plan equipment installed as of 1/1/81 is requested.

   b. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested.

   c. The correlation of these equipment items with the specific sections of NUREG-0737 [4] presented below (as applicable) is requested.

      [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and terminal blocks associated with the device also identified?]

   d. For all installed TMI Action Plan equipment identified, a System Component Evaluation Worksheet (SCEW) (in accordance with 79-01B format) is requested.

e. The approximate installation date for the TMI Action Plan equipment items is requested so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.

2. The qualification documents, e.g., the actual test reports and associated correspondence cited as evidence of qualification listed on the SCEW sheets, for all identified TMI Action Plan equipment are requested. [The identification of those reports considered to be proprietary is requested so that proper control of documents can be maintained.]

3. Where the Licensee has a standard Owners' Group position with respect to a NUREG-0737 technical area or has requested extensions of implementation dates, this information is requested in order to incorporate it into the review.

C. INSTRUCTIONS FOR TRANSMITTING INFORMATION REQUESTED

1. The schedule for completion of the FRC assignment requires that the Licensee provide the requested information within 3 weeks of the date of the RAI.

2. The Licensee may transmit the requested information as follows:

   o complete package directly to the NRC project manager

   or

   o copy of cover letter to NRC project manager and complete package to FRC.

# REFERENCES


1. W. G. Counsil
   Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification of Electrical Equipment, Millstone Nuclear Power Station, Unit No. 2
   Northeast Utilities, 26-Aug-81
   A01740

2. W. G. Counsil
   Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification of Safety-Related Electrical Equipment
   Northeast Utilities, 30-Jan-81

3. Office of Nuclear Reactor Regulation
   Safety Evaluation Report for Millstone Unit 2
   Environmental Qualification of Safety-Related
   Electrical Equipment
   NRC, 27-May-81

4. NUREG-0737, "Clarification of TMI Action Plan Requirements"
   NRC, November 1980

5. W. G. Counsil
   Letter to D. M. Crutchfield and R. A. Clark, NRC. Subject: Haddam Neck Plant, Millstone Nuclear Power Station, Units 1 & 2; Transmittal of Information to FRC
   Northeast Utilities, 09-Feb-82
   A02213, A-2226(1)

6. W. G. Counsil
   Letter to H. R. Denton, NRC. Subject: Haddam Neck Plant, Millstone Nuclear Power Station, Unit Nos. 1 and 2; TMI-2 Short-Term Lessons-Learned Implementation, with Attachments
   Northeast Utilities, 31-Dec-79(1)

7. W. G. Counsil
   Letter to D. G. Eisenhut, NRC.
   Subject: Implementation of NUREG-0737, Post-TMI Requirements-Haddam Neck Plant, Millstone Nuclear Power Station Units 1 & 2, with Attachment
   Northeast Utilities, 31-Dec-80
   A01379(1)

8. W. G. Counsil
   Letter to D. G. Eisenhut, NRC. Subject : Millstone Nuclear Power Station Unit Nos. 1 and 2; NUREG-0737 Item II.F.1.3, Containment High Range Radiation Monitor
   Northeast Utilities, 20-Oct-81
   A01379(2)