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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)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT UNIT 1

VOL. 1 OF 2

NRC DOCKET NO. 50-220

FRC PROJECT C5257

NRC TAC NO. 42476

FRC ASSIGNMENT 13

NRC CONTRACT NO. NRC-03-79-118

FRC TASK 466

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August 26, 1982

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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.

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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 have been replaced with a checksheet page stating that the proprietary information has been removed.



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) [6],* 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 [10] 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 [7], 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.

On September 23, 1981, the NRC Commissioners considered a petition (SECY-81-486) to extend the deadline for actions to be taken by licensees to achieve environmental qualification of all safety-related equipment. On September 30, 1981, the NRC Commissioners extended this deadline to the second refueling outage after March 31, 1982.

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.

The final rule, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," was subsequently issued on April 16, 1982 by the NRC (to be published in the Federal Register) to clarify and strengthen the criteria for environmental qualification of electrical equipment. The final rule is to be incorporated into 10CFR50 as Section 50.49, "Environmental Qualification of Electric Equipment for Nuclear Power Plants." The significant features of the rule are:

- o Requalification of electrical equipment in accordance with the rule will not be required for equipment qualified or being qualified in accordance with the DOR Guidelines and IE Bulletin 79-01B or NUREG-0588, provided the qualification program commenced within 90 days after the effective date of the rule.
- o The requirement to qualify equipment needed to complete one path of achieving and maintaining a cold shutdown condition has been deleted.
- o A new section has been added, covering the qualification of equipment located in mild environments.
- o The Commission deadline for actions to be taken by licensees to achieve environmental qualification of all safety-related equipment is extended to the second refueling outage after March 31, 1982.

On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [8] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

1.4 SPECIFIC ISSUE BACKGROUND

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-03, "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 performed (1) a preliminary evaluation of the Licensee's response, documented in a technical evaluation report (TER) and (2) an onsite verification inspection (November 18-20, 1980) of selected safety-related electrical equipment. Components of the containment spray, main steam isolation, and emergency cooling systems were inspected. The inspection verified proper installation of equipment, overall interface integrity, location with respect to flood level for equipment inside the containment, and manufacturer's 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 dated January 7, 1981. No deficiencies were noted.

On March 5, 1980, Niagara Mohawk Power Corporation provided the NRC with a submittal on environmental qualification for the Nine Mile Point Unit 1 plant.

On November 1, 1980, Niagara Mohawk Power Corporation provided the NRC with a revised equipment environmental qualification submittal in response to IE Bulletin 79-01B for the Nine Mile Point Unit 1 plant [1].

On February 2, 1981, Niagara Mohawk Power Corporation submitted to the NRC further equipment environmental qualification information in response to IE Bulletin 79-01B Supplement No. 3 and revised system component evaluation work sheets [12].

On June 17, 1981, FRC issued to the NRC a Technical Evaluation Report on equipment environmental qualification for Nine Mile Point Unit 1 [11].

The NRC issued a Safety Evaluation Report (SER) to Niagara Mohawk Power Corporation for Nine Mile Point Unit 1 on June 8, 1981 [13].

Requests for information [34, 35, 36] 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 [10].

By letter dated September 6, 1981, Niagara Mohawk Power Corporation transmitted to the NRC a response to the SER [14].

On February 2, 1982, Niagara Mohawk Power Corporation provided the NRC with equipment environmental qualification information regarding TMI Action Plan equipment [15].

On March 2, 1982, Niagara Mohawk Power Corporation provided (1) additional information regarding TMI Action Plan equipment, and (2) qualification documentation requested by FRC for review [16].

On April 2, 1982, Niagara Mohawk Power Corporation submitted to the NRC revised system/component evaluation work sheets and additional justification for continued operation [33].

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:

- o DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 [2].
- o NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [9].

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

- o 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 [3, 4, 5, 6].
- o NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 [10]. 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 [5] 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 Before 7/1/74	CP SER After 7/1/74	
DOR GUIDELINES			
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 [5] 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 [6] 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 [5] 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 [6] 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 [5], "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 [5] 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 [5] 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 [5] 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 [5] 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:

	<u>LOCA</u>	<u>Non-LOCA HELB</u>
Outside Containment	NUREG-0578 (100/50/1 in RCS) [*]	NUREG-0588 (10/10/0 in RCS)
Inside Containment	<u>Larger of</u> 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 contributions 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 [8] 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 activities¹ 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:
 - o 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.

¹Such 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).

- o 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 4×10^7 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 conservatism. 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 $T_{SAT} + 20^\circ F$ 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 PSAR 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, Niagara Mohawk Power Corporation, provided a response to the SER and additional qualification information in its submittals [14, 15, 16, 33] to the NRC for the Nine Mile Point Unit 1 Nuclear Power Plant.

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

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

- o the Licensee's response to the SER concerns
- o technical information received from the Licensee as a result of requests for additional information (Appendix E)
- o technical data derived from the Licensee's submittal
- o NRC DOR Guidelines or NUREG-0588 Revision 1 criteria
- o the Licensee's definition of harsh service environments (Appendix A)
- o documentation cited by the Licensee as evidence of qualification
- o applicable and available qualification documentation associated with the overall equipment environmental qualification program
- o the Licensee's analysis and/or justification of qualification
- o Licensee-proposed corrective action for qualification deficiencies
- o the Licensee's equipment/part replacement schedules
- o the Licensee's technical arguments concerning the adequacy of equipment, based on system operational considerations
- o 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/7-1-81) 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:

- o 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
- o Qualification deficiencies identified in the SER (see Figure 3-1)
- o Licensee's response to the SER
- o Licensee's statements and rationale for qualification
- o Licensee's corrective action and replacement schedule
- o Evaluation of qualification including identification of all deficiencies
- o 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

 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. _____	Page 1a
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 Timer: 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, Q, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EON, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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

o 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.

o 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

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.

o 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).

o 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.

o 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 interpreted 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.]

o 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.

o 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.

o 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----- [EQUIPMENT ITEM NO(S).: 50, 61, 100]	3
I.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION----- [EQUIPMENT ITEM NO(S).: 2, 3, 7, 11, 12, 13, 14, 16, 17, 18, 21, 23, 24, 25, 26, 38, 45, 46, 47, 48, 49]	21
II.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED----- [EQUIPMENT ITEM NO(S).: 1, 5, 6, 8, 10, 15, 19, 20, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 51, 52, 53, 54, 55, 56, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 95, 96, 98, 99]	69
II.B	EQUIPMENT NOT QUALIFIED-----	0
II.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED----- [EQUIPMENT ITEM NO(S).: 4, 9, 57, 58]	4
III.A	EQUIPMENT EXEMPT FROM QUALIFICATION----- [EQUIPMENT ITEM NO(S).: 36]	1
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW-----	0
IV	DOCUMENTATION NOT MADE AVAILABLE----- [EQUIPMENT ITEM NO(S).: 94, 97]	2
TOTAL		100

TABLE 4-2
QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE----- 68 [EQUIPMENT ITEM NO(S).: 1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14, 15, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 43, 44, 51, 53, 55, 59, 60, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 98, 99]	
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED----- 24 [EQUIPMENT ITEM NO(S).: 5, 6, 8, 16, 17, 18, 28, 42, 45, 46, 47, 48, 53, 54, 56, 65, 73, 74, 75, 76, 77, 86, 95, 96]	
3. AGING DEGRADATION EVALUATED ADEQUATELY----- 22 [EQUIPMENT ITEM NO(S).: 4, 5, 6, 8, 9, 13, 16, 17, 18, 19, 20, 21, 28, 52, 57, 58, 73, 74, 75, 76, 77, 82]	
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)----- 22 [EQUIPMENT ITEM NO(S).: 4, 5, 6, 8, 9, 13, 16, 17, 18, 19, 20, 28, 42, 52, 57, 58, 73, 74, 75, 76, 77, 82]	
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION----- 2 [EQUIPMENT ITEM NO(S).: 17, 86]	
6. CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)----- 4 [EQUIPMENT ITEM NO(S).: 13, 16, 17, 18]	
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE: A. - PEAK TEMPERATURE ADEQUATE----- 0 B. - PEAK PRESSURE ADEQUATE----- 4 [EQUIPMENT ITEM NO(S).: 19, 20, 28, 42]	

Table 4-2 (Cont.)

QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
=====	
C. - DURATION ADEQUATE-----	0
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY-----	0
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE----- [EQUIPMENT ITEM NO(S).: 19, 20]	2
8. CRITERIA REGARDING SPRAY SATISFIED----- [EQUIPMENT ITEM NO(S).: 52]	1
9. CRITERIA REGARDING SUBMERGENCE SATISFIED-----	0
10. CRITERIA REGARDING RADIATION SATISFIED----- [EQUIPMENT ITEM NO(S).: 17, 19, 20, 21, 28, 49, 52, 86]	8
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED-----	0
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED-----	0
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED----- [EQUIPMENT ITEM NO(S).: 17]	1
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED-----	0
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).: 27, 30, 35]	3
2. EQUIPMENT MODIFICATION-----	0
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-----	0
8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITEMS)-- [EQUIPMENT ITEM NO(S).: 2, 3, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 45, 46, 47, 48, 49, 51, 55, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 79, 80, 82, 85, 87, 88, 89, 90, 91, 92, 93, 98, 99]	61
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED (SEE SPECIFIC EQUIPMENT ITEM FOR COMPLETION DATE)-----	0
=====	=====

Table 4-4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		EPC EQUIPMENT ITEM NUMBERS															
		1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	
NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----	X	X	X		X	X	X	X		X	X	X		X	X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----						X	X	X		X						
3.	AGING DEGRADATION EVALUATED ADEQUATELY-----					X	X	X		X	X				X		
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)-----					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														X		
	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)																	
1.A	EQUIPMENT QUALIFIED-----																
1.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----																
11.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED-----	X	X	X		X	X	X		X	X	X	X	X	X	X	
11.B	EQUIPMENT NOT QUALIFIED-----																
11.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED-----					X				X							
111.A	EQUIPMENT EXEMPT FROM QUALIFICATION-----																
111.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---)	X	X					X		X	X	X	X	X	X	X	
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----																	

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Table 4-4 (Cont.)

EQUIPMENT ELIMINATION/QUALIFICATION SUMMARY REPORT

EPC REQUIREMENTS		DESIGNATION: X = DEFICIENCY		EPC EQUIPMENT ITEM NUMBER	
				1016101710181019102010211022102310241025102610271028102910301	
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE					
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED					
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 DEVELOPED ADEQUATELY					
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE					
8. CRITERIA REGARDING SPRAY SATISFIED					
9. CRITERIA REGARDING SURGERY 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 PARAG (1 HOUR + FUNCTION TIME) SATISFIED					
16. CRITERIA REGARDING MARGINS SATISFIED (MUREG-6588, CAT. 1)					
EPC QUALIFICATION CATEGORY (DESIGNATION: X CATEGORY)					
1. EQUIPMENT QUALIFIED					
1.A. EQUIPMENT QUALIFICATION PENDING MODIFICATION					
1.B. EQUIPMENT QUALIFIED, NOT ESTABLISHED					
1.C. EQUIPMENT NOT QUALIFIED					
1.D. EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED					
1.E. EQUIPMENT EXEMPT FROM QUALIFICATION					
1.F. EQUIPMENT NOT IN THE SCOPE OF THE REVIEW					
1.G. CONCENTRATION NOT MADE AVAILABLE					
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X ACTION SPECIFIED)					
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT					
2. EQUIPMENT MODIFICATION					
3. EQUIPMENT RELOCATION ABOVE THE SURFACE LEVEL					
4. RELOCATION OF SHIELD EQUIPMENT FROM RADIATION SOURCE					
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS					
6. EQUIPMENT RELOCATION TO A NEW ENVIRONMENT					
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS					
8. OTHER (SPECIFY EQUIPMENT ITEM IF CHECKED)					
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED					

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		FRC EQUIPMENT ITEM NUMBERS															
		1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	
APC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE		X	X	X	X	X		X	X	X	X	X		X	X		
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED													X			X	
3. AGING DEGRADATION EVALUATED ADEQUATELY																	
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)																	
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																	
A. - PEAK TEMPERATURE ADEQUATE																	
B. - PEAK PRESSURE ADEQUATE													X				
C. - DURATION ADEQUATE																	
D. - REQUIRED PROFILE DEVELOPED 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																	
I.B. EQUIPMENT QUALIFICATION PENDING MODIFICATION										X							
II.A. EQUIPMENT QUALIFICATION NOT ESTABLISHED		X	X	X	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																	
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						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 FIELD ENVIRONMENT																	
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																	
8. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)		X	X	X	X	X		X	X	X	X	X					X
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																	

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Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		EQUIPMENT TYPE NUMBER															
		1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	
PRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----						X		X		X					X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----	X	X	X					X	X		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-----								X								
9.	CRITERIA REGARDING SURGERY SATISFIED-----																
10.	CRITERIA REGARDING RADIATION SATISFIED-----			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)-----																
PRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																	
I.	EQUIPMENT QUALIFIED-----																
II.	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----	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-----														X	X	
III.	EQUIPMENT EXEMPT FROM QUALIFICATION-----																
III.A.	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 SURGERY LEVEL-----																
4.	RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE-----																
5.	VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS-----																
6.	EQUIPMENT RELOCATION TO A FIELD ENVIRONMENT-----																
7.	QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS-----																
8.	OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)-----	X	X	X	X		X				X						
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----																	

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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	X	X	X	X	X	X	X	X	X	X	X	X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----					X								X	X	X	
3.	AGING DEGRADATION EVALUATED ADEQUATELY-----													X	X	X	
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)-----													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 SURGERGENCE 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)																	
1.A	EQUIPMENT QUALIFIED-----	X															
1.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----																
11.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED-----	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11.D	EQUIPMENT NOT QUALIFIED-----																
11.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED-----																
111.A	EQUIPMENT EXEMPT FROM QUALIFICATION-----																
111.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 SURGERGENCE 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---)-----	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----																	

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Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		FAC EQUIPMENT ITEM NUMBER															
		1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	
I HRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----	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)-----																
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 (HUREG-0588, CAT. 1)-----																
I HRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																	
1.A	EQUIPMENT QUALIFIED-----																
1.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----																
II.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED-----	X	X	X	X	X	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-----																
III.A	EQUIPMENT EXEMPT FROM QUALIFICATION-----																
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW-----																
IV	DOCUMENTATION NOT MADE AVAILABLE-----																
I 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---)-----				X	X		X			X		X	X	X	X	
I SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----																	

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Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		FRC EQUIPMENT ITEM NUMBERS									
		1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)											
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----	X	X	X					X	X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIFICS ESTABLISHED-----					X	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 + FRACTION TIME) SATISFIED-----										
16.	CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)-----										
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)											
1.A	EQUIPMENT QUALIFIED-----										X
1.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----										
11.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED-----	X	X	X		X	X		X	X	
11.B	EQUIPMENT NOT QUALIFIED-----										
11.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED-----										
111.A	EQUIPMENT EXEMPT FROM QUALIFICATION-----										
111.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 FIELD ENVIRONMENT-----										
7.	QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS-----										
8.	OTHER (---SEE SPECIFIC EQUIPMENT ITEM IF CHECKED---)	X	X	X					X	X	
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 [14] to the NRC SER.

4.3.1 Completeness of Safety-Related Equipment List

Section 3.1 of the NRC SER [13] identified the following concern:

"Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the Licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. 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 501 items of equipment which were assessed by the staff."

In response to this concern, the Licensee stated [14]:

"A. Systems List

Based on the NMPC submittal (November 3, 1980 assessment), the staff concluded that the information on safety-related systems was insufficient to verify that systems considered were all the systems required to achieve or support the following functions:

- 1) emergency reactor shutdown
- 2) containment isolation
- 3) reactor core cooling
- 4) containment heat removal
- 5) core residual heat removal
- 6) prevention of significant release radioactive material to the environment

The list of NMP-1 systems presented in the November 3, 1980 submittal included all systems, both inside and outside potentially harsh areas,

necessary to provide the six functions listed above. The following systems list includes the safety function provided by each system.

- o Common Electrical Equipment (CEE): includes electrical components common to all systems, e.g., cable, connectors, etc., and therefore supports all six functions.
- o Reactor Isolation (RI): provides function 6
- o Automatic Depressurization System (ADS): provides functions 3 and 5
- o Containment Isolation -- Drywell (CID): provides functions 2 and 6
- o Containment Isolation -- Torus (CTI): provides functions 2 and 6
- o Core Spray (CS): provides functions 3 and 5
- o Reactor Vessel Instrumentation (RVI): initiates functions 1, 2, 3, 4, and 6
- o Additional Instrumentation (AI): initiates functions 1, 4, and 6
- o Reactor Building Closed Loop Cooling (RBCLC): supports functions 3 and 4
- o Control Rod Drive (CRD): provides function 1
- o MG Sets 162 and 172: support all 6 functions
- o Power Distribution (PD): supports all 6 functions
- o Containment Spray (CoS): provides functions 4 and 5

It should be noted that the systems list originally provided in the November 3, 1980 submittal has been revised.

The following six systems have been deleted for the reasons provided.

- o HPCI System

Reason - The HPCI system is not powered from emergency power supplies and is not taken credit for in safety analyses. Its safety-related function is duplicated by core spray in conjunction with ADS.

- o Emergency Condenser System

Reason - The main purpose of the emergency condenser system is to assure long term cooling during isolation events by maintaining coolant inventory. Credit is not taken for this system in LOCA/HELB safety analyses.

o CAD and H₂O₂ Monitoring Systems

Reason - The purpose of the inerting systems is to provide an inert nitrogen atmosphere in the drywell and torus in case the core spray system does not function properly following a LOCA; i.e., these systems only serve as a backup to the core spray system. Possible use of the H₂O₂ monitoring system for radiation sampling of drywell air falls under the scope of R.G. 1.97, and the NRC has indicated that those items will be evaluated separately from the IEB 79-01B response.

o Reactor Building Emergency Ventilation System

Reason - According to the NMP-1 FSAR, the reactor building emergency ventilation system is not a required engineered safeguard. A postulated 100% core meltdown without reactor building emergency ventilation will approach 10 CFR 100 limits only if the reactor building integrity is such that it leaks 1800% of its volume per day at -0.25 inches of water differential pressure. The reactor building is designed for maximum leakage of 100% of building volume per day at a -0.25 inches of water differential pressure.

o MG Sets 162-172

Reason - The MG system has been removed from the 79-01B scope because it has been determined that its components are not subjected to harsh environments. Our definition of mild environment is discussed in Section 3.2.

Thus, with the exception of the MG sets, the systems list provided beforehand represents the 79-01B systems list for NMP-1.

B. Display Instrumentation

The staff requested that NMPC provide a complete list of display instrumentation mentioned in LOCA and HELB emergency procedures. Component evaluation worksheets were requested for all components of display instrumentation exposed to harsh environments with the exception of non-safety related equipment and post-accident sampling, monitoring and radiation monitoring equipment. Justification for considering an instrument as non-safety related and assurance that its subsequent failure will not mislead the operator or adversely affect accident mitigation are required. Post-accident sampling and monitoring equipment will be reviewed in conjunction with TMI Lessons-Learned modifications.

Table 3-3 provides a listing of display instruments mentioned in the NMP-1 special operating procedures for LOCA and HELB. The table includes a column listing the associated instrument components currently within the 79-01B workscope, i.e., in harsh environments. Component evaluation worksheets are provided for these items in Appendix A.

For the remaining display instruments, NMPC will defer environmental qualification until these procedures have been revised using emergency procedure guidelines which are currently being reviewed by the staff. This deferment is considered justified in that the components being qualified now are considered sufficient to ensure safe handling of the plant by the operator.

C. Safety-Related Electrical Components

A component-by-component review has been performed by NMPC to more closely define component safety-related functions and revise the master parts list presented in the previous (November 2, 1980 assessment) report.

Revision of the master parts list of the safety-related electrical components essential to LOCA/HELB mitigation is based on the following considerations:

- o Analysis of components safety-related functions and deletion of those components whose operations are not essential to LOCA/HELB mitigation
- o Deletion of accident environments and deletion of those components which are located in the mild environments.

A current listing of safety-related electrical components considered by NMPC to be necessary to mitigate the consequences of a LOCA/HELB is provided in Table 3-1. Display instruments located in the harsh environments are noted in Table 3-3 and included in Table 3-1.

A listing of the components previously considered in the scope of IEB 79-01B but now deleted based on the above reasons is provided in Table 3-2, and a component-by-component justification is provided in Appendix B."

A detailed evaluation of the Licensee's response is presented in Appendix C.

4.3.2 Containment Spray System

Section 3.2 of the NRC SER [13] identified the following concern:

"Commission Memorandum and Order CLI-80-21 requires that the DOR guidelines and the 'For Comment' NUREG-0588 are to be used as the criteria for establishing the adequacy of the safety-related electrical equipment environmental qualification program. These documents provide the option of establishing a bounding pressure and temperature condition based on plant-specific analysis identified in the Licensee's Final Safety Analysis Report (FSAR) or based on generic profiles using the methods identified in these documents.

On this basis, the staff has assumed, unless otherwise noted, that the analysis for developing the environmental envelopes for Nine Mile Point Unit 1, 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."

In response to this concern, the Licensee stated [14]:

"3.2 Service Conditions

In the previous NMPC submittal (November 3, 1980 assessments) a detailed procedure for developing the environmental envelopes, relative to the temperature, pressure, and the containment spray, in accordance with the guidelines delineated in the IEB 79-01B and the NUREG-0588 'For Comment,' was presented.

For the purpose of this report, a harsh environment is intended to represent those service conditions which result from a LOCA or HELB and are outside the equipment's specified operating band.

Mild environment qualification guidelines have not yet been issued. At the NRC staff meeting on July 7-10, 1981, one definition presented by the NRC staff indicated that the equipment would be considered in the mild environment category as long as the environmental conditions resulting from a LOCA/HELB do not exceed: (1) the range originally specified for the equipment, or (2) the design range specified by the manufacturer of the equipment. For the purpose of this report, this

definition has been applied to exempt the equipment now considered located in the mild environments from the current scope of IEB 79-01B.

In conjunction with the review of environmental conditions resulting from line breaks inside containment, the staff requested NMPC verify that the NMP-1 containment spray system is not subject to a disabling single-component failure. The NMP-1 FSAR states the containment spray system consists of two independent and separate full capacity systems supplied by station reserve powers or from either of the two emergency diesel generators. One system will start automatically, the other is started by the operator in the control room.

Limiting service conditions have been determined for postulated accident conditions including LOCA/HELB inside containment, and HELB outside containment. These service conditions include pressure, temperature, humidity, and radiation dose."

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

4.3.3 Environmental Service Conditions

4.3.3.1 Temperature, Pressure, and Humidity Conditions Inside Containment

Section 3.3 of the NRC SER [13] identified the following concern:

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

	<u>Max Temp (°F)</u>	<u>Max Press (psig)</u>	<u>Humidity (%)</u>
LOCA	340	35	100

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for analytical uncertainties in the calculated temperature profiles for postulated accidents. A margin of 20°F above steam saturated temperature is considered to be appropriate for either a postulated LOCA or MSLE, whichever is controlling as to potential adverse environmental effects on equipment.

Limiting pressure/temperature versus time profiles developed by the Licensee to envelope steam-line-break conditions inside containment are different from the pressure and temperature profiles in the FSAR. Because of this, the Licensee should provide the related analysis for staff review."

The Licensee responded to the NRC concern as follows [14]:

"The limiting temperature/pressure versus time profiles submitted were different from the profiles in the FSAR. Consequently, the staff requested that the related analysis be provided.

In lieu of providing the analysis, NMPC has revised the limiting containment temperature/pressure profiles to those provided in the FSAR for recirculation line break, with 20°F added as margin to account for the possibility of local superheat. The FSAR curves were previously provided in the November 3, 1980 submittal, and are summarized in Table 4-1 and shown in Figures 4-12A and 4-12B of this report.

NMPC considers use of the FSAR curves plus 20°F appropriate for the following reasons:

- A) The FSAR states that the actuation of containment sprays would eliminate the possibility of superheat temperature in the bulk of the drywell.
- B) The NRC Guidelines, Section 4.2, allows that the LOCA environment envelopes main steamline break environments in plants with automatic containment spray systems not subject to disabling single failures."

It appears that the Licensee has resolved the NRC concern.

4.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment

Section 3.4 of the NRC SER [13] stated:

"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) Isolation valve cubicle
- (2) Steam tunnel entrance
- (3) Steam tunnel
- (4) Condenser area
- (5) Isolation valve cubicle
- (6) Turbine building
- (7) Emergency condenser valve cubicle
- (8) Containment spray heat exchanger area
- (9) Emergency condenser area
- (10) Emergency condenser return valve cubicle
- (11) Clean-up system cubicle
- (12) Instrument rooms east and west
- (13) Instrument room north

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

In response, the Licensee stated [14]:

"The staff reviewed the service conditions defined for HELB's outside containment and verified that the parameters identified are acceptable. These service conditions are summarized in Table 4-1 and shown in Figures 4-1 through 4-11 of this report."

4.3.3.3 Nuclear Radiation Dose (Inside and Outside Containment)

Section 3.8 of the NRC SER [13] stated:

"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 of 5×10^7 rads. This value envelopes the DOR guideline requirements and is therefore acceptable.

A required value outside containment of 4.1×10^6 rads has been used by the Licensee to specify limiting radiation levels within the reactor injection system in the reactor building. 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."

The Licensee stated [14]:

"The staff evaluation stated that the integrated radiation dose values for inside and outside containment are acceptable. These values were determined in accordance with prescribed criteria in the DOR Guidelines and Supplement No. 2 to I.E. Bulletin 79-01B. Outside containment integrated radiation dose values include contributions from post-LOCA recirculating fluid lines."

4.3.4 Submergence

Section 3.5 of the NRC SER [13] identified the following concern:

"The Licensee has stated that submergence in the drywell is not a concern because of the low resistance flowpath to the torus and the large torus-free volume. It is not evident that the licensee considered the effects of all steamline breaks, both inside and outside containment (for example, a feedwater line break outside containment), and their relation to the submergence of Class 1E equipment. The licensee should address this concern."

In response to this concern, the Licensee stated [14]:

"The staff evaluation of the submergence service condition indicated that it was not evident that NMPC had considered the effects of all steamline breaks, both inside and outside containment.

The previous NMPC conclusion that accidental submergence of required Class 1E equipment in containment is not a concern was based on consideration of all line breaks in containment.

Consideration of submergence of equipment outside containment was not a requirement of I.F. Bulletin 79-01B. However, submergence outside containment does not appear to be a concern due to the limited amount of fluid discharged from postulated HELB's outside containment before break isolation, and because of equipment separation. For example, the lowest elevation in the NMP-1 reactor building is divided into four separate compartments; the safety related equipment at this elevation is redundant and located in separate compartments. NMPC will investigate the submergence service condition further and submit any new information as it becomes available."

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

4.3.5 Chemical Spray

Section 3.6 of the NRC SER [13] identified the following concern:

"The Licensee has stated that the plant's primary containment does not have a chemical spray system. If, however, the plant design has a demineralized water spray, its effects should be examined and the Licensee should address this concern."

In response to this concern, the Licensee stated [14]:

"The staff requested NMPC to address the effects of demineralized water spray in its equipment qualification efforts.

The NMP-1 containment spray system is the only source of spray. This spray is demineralized water taken from the torus. The spray header nozzles are arranged to minimize the impact on equipment and the nozzles produce fine spray droplets less than 1000 microns in size.

Various electrical components located inside containment were tested using various mixtures of chemical spray which, in fact, were a more severe simulation than the demineralized water spray. For example, boric acid and boron were used in the chemical spray/LOCA tests for Limiting Valve Operators, Raychem cables, and GE cables.

Furthermore, various electrical components are sealed in NEMA 4 watertight enclosures which open from the bottom only; for example, the Dresser 1525VX relief valve and solenoid are contained in such enclosures. Therefore, spray could not affect operation of these components.

NMPC will consider the effects of demineralized water spray in its qualification of equipment located inside containment."

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 [14] identified the following concern:

"Section 7 of the DOR guidelines does not require a qualified life to be established for all safety-related electrical equipment. However, the following actions are required:

- (1) Make a detailed comparison of existing equipment and the materials identified in Appendix C of the DOR guidelines. The first supplement to IEB-79-01B requires licensees to utilize the table in Appendix C and identify any additional materials as the 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, 5 years, 15 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 [14]:

"Section 7 of the DOR Guidelines does not require that a qualified life be established for all safety-related electrical equipment. However, as required by the NRC staff, the supplemental information to verify and identify the degree of conformance to the following requirements has been submitted.

1. NRC Requirement - Make a detailed comparison of existing equipment and the materials identified in Appendix C of the DOR Guidelines.

NMPC Action - NMPC has engaged NUS Corporation in an extensive qualification assessment program to collect environmental qualification data, and to determine the expected life of each safety-related electrical component. This qualification assessment program has been implemented in the following manner:

A. Obtain Complete Equipment Description

The material receipt forms, purchase requisition forms, master parts lists, and various other documents were reviewed to identify proper model number, serial number, and rating of each component. This information was used to obtain each component's materials data.

B. Contact Vendors to Obtain Materials, Design, and Qualification Data

Each vendor was contacted to obtain the following information:-

- o Bill of Material and Materials Designation Data - If the bill of materials could not be provided, then a list of age-sensitive (non-metallic) materials was requested.
- o Manufacturer catalogs and manuals
- o Environmental Qualification Reports - If no qualification or materials data for the subject component could be provided, then complete qualification information (qualification data, materials/parts description, catalog, and manuals) for a replacement model which is qualified or qualifiable was requested.

C. Perform a Study to Environmentally Qualify Equipment

Using the data obtained from the above tasks, an expected life analysis based upon the following applicable criteria was performed for each component.

- o Operational Cycling Effects - Wherever in-service operational cycling was identified, it was compared with the manufacturer's recommended cycles and with the actual operational cycling tests that were performed.
- o Time/Temperature Effects - The expected life was calculated based upon the time/temperature effects of the weakest material of the component using the Arrhenius Theory, as follows:

$$\ln(t) = \frac{E_a}{K_b} \left(\frac{1}{T} \right) + A \quad (1)$$

where,

\ln = Natural Logarithm
 t = Expected Life (Hours)
 E_a = Activation Energy (eV)
 K_b = Boltzmann's Constant (8.617×10^{-5} eV/°K)
 T = Service Temperature (°K)
 A = Constant

If an accelerated aging simulation test was performed, the equivalent life at the service temperature was calculated using the Arrhenius Theory as follows:

$$t_2 = t_1 \exp \left[\left(\frac{E_a}{K_b} \right) \left(\frac{1}{T_2} - \frac{1}{T_1} \right) \right] \quad (2)$$

where,

t_1 = Time at Aging Temperature (Hours)
 t_2 = Time at Service Temperature (Hours)
 E_a = Activation Energy (eV)
 K_b = Boltzmann's Constant (eV/°K)
 T_1 = Aging Temperature (°K)
 T_2 = Service Temperature (°K)

- o Humidity Effects - A literature search to evaluate the effects of relative humidity on the life of the subject component and its ability to perform its safety-related functions was performed.
- o Radiation Effects - Specified radiation dosage was compared with the assessed qualification test data and with the damage threshold level of each material in the subject component.
- o Harsh Environment Effects - Using the vendor design data, test data, aging analysis and the Arrhenius Theory, an evaluation was made to determine if the subject component can be safely operated under these conditions.

D. Qualification Assessment Summary Report

Based on the results of the above tasks, a report was prepared for each component where such an analysis was conducted. The expected life determined from the analysis has been noted on the component evaluation worksheets.

This effort is continuing for these components noted as 'Assessment On-Going' in Table 3-1.

2. NRC Requirement - Establish an on-going program to review surveillance and maintenance records to identify age-related degradations.

NMPC Action - NMPC/NUS has established an on-going program to review surveillance and maintenance records of the safety-related components. Primarily, this program has been exercised to more closely define the safety-related functions of the electrical components essential to LOCA/HELB mitigation. In the future, this program will be expanded to identify age-related degradations.

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

NMPC Action - Wherever practical, the maintenance records and replacement schedules will be modified to include the considerations of aging characteristics for the safety-related components."

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
SITE WIFE BUILT 1

IRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
1	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1 SIZE 1	CLEAN UP SYSTEM COPICIES, ELEV. 261
2	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1 SIZES 0, 4	CONTAINMENT
3	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1	CONTAINMENT
4	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1-00	REACTOR BUILDING
5	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1 SIZE 0	CRITICALITY SPRAY HEAT EXCHANGER AND
6	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1	EMERGENCY CONDENSER ISOLATION VALVE
7	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1 SIZES 000, 2, 1	CONTAINMENT
8	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1 SIZES 000, 2	EMERGENCY CONDENSER ISOLATION VALVE
9	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM1000	REACTOR BUILDING
10	SOLENOID VALVE	LAWRENCE	240CSMPS	REACTOR BUILDING
11	SOLENOID VALVE	DECCO	24166	STEAM TUNNEL
12	SOLENOID VALVE	DECCO	24166	REACTOR BUILDING
13	SOLENOID VALVE	ASCO	HVA904059A	REACTOR BUILDING
14	SOLENOID VALVE	GENERAL ELECTRIC	1525VN	CONTAINMENT
15	SOLENOID VALVE	ASCO	8100H61RU	REACTOR BUILDING
16	SOLENOID VALVE	ASCO	4PLR100072F	EMERGENCY CONDENSER ISOLATION VALVE
17	SOLENOID VALVE	ASCO	8100 SERIES	EMERGENCY CONDENSER RETURN VALVE
18	SOLENOID VALVE	ASCO	WPLR100048F	REACTOR BUILDING
19	TRIP UNIT	ROSEMOUNT	5100H 164C5150 SERIES	REACTOR BUILDING
20	TRIP UNIT	ROSEMOUNT	5100H 165C150 SERIES	REACTOR BUILDING
21	TRANSDUCER, E/P	FISHER CONTROLS	546 41540P2	REACTOR BUILDING
22	THERMOCOUPLE	PALL TRINITY MICRO	TYPE C076	REACTOR BUILDING
23	PRESSURE TRANSMITTER	GE/MAC	551	REACTOR BUILDING, ELEV. 191'0"
24	PRESSURE TRANSMITTER	GE/MAC	551 4512K11001	REACTOR BUILDING, ELEV. 191'0"
25	PRESSURE TRANSMITTER	GE/MAC	551 JB194416611	REACTOR BUILDING, ELEV. 261'0"
26	PRESSURE TRANSMITTER	GE/MAC	551 LB4444111175	REACTOR BUILDING, ELEV. 261'0"
27	PRESSURE TRANSMITTER	ROSEMOUNT	1151	REACTOR BUILDING, ELEV. 261'0"
28	TEMPERATURE SWITCH	FEDVAL	1700240	STEAM TUNNEL, ELEV. 240'0"
29	D/P TRANSMITTER	ROSEMOUNT	11510P 7E22T0003PH	REACTOR BUILDING, ELEV. 261'0"
30	D/P TRANSMITTER	ROSEMOUNT	11510P	REACTOR BUILDING, ELEV. 261'0"
31	D/P TRANSMITTER	ROSEMOUNT	11510P 7E22T0003PH	REACTOR BUILDING, ELEV. 227'0"
32	TEMPERATURE ELEMENT	MICRO PICKEL	UNKNOWN	EMERGENCY CONDENSER ISOLATION VALVE
33	PRESSURE SWITCH	HERCOLD	50F136 SERIES L5A12H21F	REACTOR BUILDING, ELEV. 261'0"
34	PRESSURE SWITCH	HERCOLD	D45432	REACTOR BUILDING, ELEV. 261'0"
35	LEVEL TRANSMITTER	ROSEMOUNT	11510P	REACTOR BUILDING, ELEV. 261'0"
36	LEVEL TRANSMITTER	ROSEMOUNT	11510P	REACTOR BUILDING, ELEV. 191'0"
37	CONTROL SWITCH	HERCOLD	CP4122	REACTOR BUILDING, ELEV. 236'0"
38	LEVEL TRANSMITTER	GENERAL ELECTRIC	551 BR215619079	REACTOR BUILDING, ELEV. 261'0"
39	FLOW TRANSMITTER	ROSEMOUNT	11510P	REACTOR BUILDING, ELEV. 237'0"
40	FLOW TRANSMITTER	ROSEMOUNT	11510P 4E221P4H	REACTOR BUILDING, ELEV. 237'0"
41	ELECTRIC MOTOR	GENERAL ELECTRIC	5K445A249A C01610R8	REACTOR BUILDING
42	ELECTRIC MOTOR	GENERAL ELECTRIC	5K424R17C7 HC8165172	REACTOR BUILDING, ELEV. 237'0"
43	ELECTRIC MOTOR	GENERAL ELECTRIC	5K432R4C136A	REACTOR BUILDING, ELEV. 191'0"
44	ELECTRIC MOTOR	GENERAL ELECTRIC	5K416AXC166A HC4165174	REACTOR BUILDING, ELEV. 191'0"
45	POSITION SWITCH	RAMCO	D2400X	REACTOR BUILDING, ELEV. 237'0"
46	POSITION SWITCH	RAMCO	D2400X	STEAM TUNNEL
47	POSITION SWITCH	RAMCO	D2400X	EMERGENCY CONDENSER ISOLATION VALVE
48	POSITION SWITCH	PICRO SWITCH	11151	REACTOR BUILDING, ELEV. 237'0"
49	POSITION SWITCH	RAMCO	5L3C5917	STEAM TUNNEL, ELEV. 240'0"

EQUIPMENT ENVIRONMENTAL QUALIFICATION I
EQUIPMENT ITEM CHECKSHEET INDEX I
PINE HILL POINT I

ITEM NO.	COMPONENT	FABRICATOR	MODEL NUMBER	LOCATION
50	POSITION SWITCH	LANSO	SL31	EMERGENCY COMPRESSED RETURN VALVE CH TUNNEL BUILDING COLLECTOR AREA, 41
51	RADIATION DETECTOR	GENERAL ELECTRIC	194X52797 129P248AG1	CONTAINMENT
52	ELECTRICAL CONNECTOR	D.G. O'BRIEN	1952R P11 16 AND 4112 J	CONTAINMENT
53	TERMINAL BLOCK	GENERAL ELECTRIC	ENS AND EN25	CONTAINMENT
54	ELECTRICAL CABLE, INSTRUMENT	KAYCHER	HC5900	CONTAINMENT
55	ELECTRICAL SEALANT	J-M	DUKSEAL	STEAM TUNNEL, ELEV. 240'0"
56	ELECTRICAL CONNECTOR	BURNDY	GZ	CONTAINMENT
57	TERMINAL BLOCK	BURNDY	QAP	STEAM TUNNEL, ELEV. 240'0"
58	ELECTRICAL CONNECTOR	BURNDY	QARCH	CONTAINMENT
59	ELECTRICAL CABLE SPLICE	AMP	PPE INSULATED	STEAM TUNNEL, ELEV. 240'0"
60	ELECTRICAL CONNECTOR	AMP	RING TONGUE TERMINAL	CONTAINMENT
61	TERMINAL BLOCK	OZ GEORGE	XL	STEAM TUNNEL, ELEV. 240'0"
62	CIRCUIT BREAKER	GENERAL ELECTRIC	AKD5	REACTOR BUILDING
63	ELECTRICAL TAPE	3M/ELECTRO PRODUCTS	NO 83	STEAM TUNNEL, ELEV. 240'0"
64	ELECTRICAL SEALANT	GENERAL ELECTRIC	NO 227	STEAM TUNNEL, ELEV. 240'0"
65	ELECTRICAL CABLE	GENERAL ELECTRIC	VULKENE CABLE	CONTAINMENT
66	ELECTRICAL INSULATING VARNISH	GENERAL ELECTRIC	NO 1109 BLACK INSUL VARNISH	STEAM TUNNEL, ELEV. 240'0"
67	ELECTRICAL TAPE	GENERAL ELECTRIC	NO 4180	STEAM TUNNEL, ELEV. 240'0"
68	ELECTRICAL SEALANT	KERITE	CEMENT	STEAM TUNNEL, ELEV. 240'0"
69	ELECTRICAL TAPE	KERITE	1/4 INCH FRICTION TAPE	STEAM TUNNEL, ELEV. 240'0"
70	SKV TERMINAL INSULATION	KERITE	SPLICING COMPOUND TAPE	STEAM TUNNEL, ELEV. 240'0"
71	ELECTRICAL CABLE, POWER	KERITE	QUADAPLEX ASSEMBLY SKV	STEAM TUNNEL
72	ROTOR CONTROL CENTER	GENERAL ELECTRIC	1C7700	REACTOR BUILDING, ELEV. 281'0"
73	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	REACTOR BUILDING, ELEV. 281'0"
74	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	REACTOR BUILDING, ELEV. 281'0"
75	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	DRYWELL ELEV. 281'0"
76	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	REACTOR BUILDING, ELEV. 281'0"
77	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	REACTOR BUILDING, ELEV. 281'0"
78	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SH0000	REACTOR BUILDING, ELEV. 281'0"
79	SOLENOID VALVE	ASCO	HT8317A29	REACTOR BUILDING, ELEV. 281'0"
80	LEVEL TRANSMITTER	ROSEMOUNT	1152T0260	REACTOR BUILDING, ELEV. 198'0"
81	PRESSURE TRANSMITTER	ROSEMOUNT	1153CA9	REACTOR BUILDING, ELEV. 281'0"
82	PRESSURE TRANSMITTER	ROSEMOUNT	1153 SERIFS A	REACTOR BUILDING, ELEV. 281'0"
83	LEVEL TRANSMITTER	ROSEMOUNT	11530A5	REACTOR BUILDING, ELEV. 237'0"
84	FLOW SWITCH	FOXBORO	11101 TRANSMITTER	REACTOR BUILDING, ELEV. 281'0"
85	PRESSURE SWITCH	STATIC-O-RING	5% AK151C1A	REACTOR BUILDING, ELEV. 237'0"
86	RADIATION DETECTOR	GENERAL ATOMIC	K021	REACTOR BUILDING, ELEV. 281'0"
87	LIMIT SWITCH	NIRO SWITCH	F	REACTOR BUILDING, ELEV. 237'0"
88	THERMOCOUPLE	OMEGA	H445A27112PH114TR34	REACTOR BUILDING, ELEV. 281'0"
89	THERMOCOUPLE	PTCO	0231710820195	CONTAINMENT
90	THERMOCOUPLE	PTCO	0231710820195	REACTOR BUILDING, ELEV. 281'0"
91	ELECTRIC MOTOR	FRANKLIN MOTOR/PUMPS PUMP	3C15H1	REACTOR BUILDING, ELEV. 237'0"
92	ELECTRICAL CONNECTOR	D.G. O'BRIEN	C10C0001G14 C10C1001C21	REACTOR BUILDING, ELEV. 306'0"
93	ELECTRICAL CONNECTOR	D.G. O'BRIEN	C10C0001G14, C10C1001G21	REACTOR BUILDING, ELEV. 261'0"
94	ELECTRICAL CABLE, COAXIAL	ROCKWELL	R556104	REACTOR BUILDING VARIOUS ELEVATIONS
95	ELECTRICAL CABLE, INSTRUMENT	ROCKWELL	TSP16	REACTOR BUILDING VARIOUS ELEVATIONS
96	ELECTRICAL CABLE, CONTROL	ROCKWELL	70	REACTOR BUILDING VARIOUS ELEVATIONS
97	ELECTRICAL CABLE, THERMOCOUPLE	ELITE	THERMOCOUPLE CABLE 16 AWG	REACTOR BUILDING VARIOUS ELEVATIONS
98	MOTOR STARTER	GENERAL ELECTRIC	CH207-223444	REACTOR BUILDING, ELEV. 237'0"
99	CIRCUIT BREAKERS	GENERAL ELECTRIC	NTE20	REACTOR BUILDING, ELEV. 281'0"
100	POSITION SWITCH	NAPCO	SL3CS8TH	STEAM TUNNEL, ELEV. 240'0"

TER-05257-466



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ITEM NO. 1
MOTORIZED VALVE ACTUATOR LOCATED IN THE CLEAN UP SYSTEM CUBICLES, ELEV. 261'0"
LIMITORQUE MODEL SB-1
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 1
LICENSEE REFERENCE(S): 43
FUNCTION (PLANT ID): REACTOR CLEANUP OUTLET ISOLATION VALVE (IV 33-04)
LICENSEE SUBMITTAL: SCEW(S): B-18 [33]

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

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.
- ☒ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

SEE Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61VF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTES 1 & 2)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee NOTE 6 states,

"Equipment will be replaced if qualification cannot be substantiated."

2. PSR # 43 (Licensee Reference 24 [33]) was not available for review.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ITEM NO. 2

MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT

LIMITORQUE MODEL SB; SIZES 0, 4

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 2

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MAIN STEAM ISOLATION VALVE (IV 01-02, IV 01-01,
VI-33-02, IV 33-01)

LICENSEE SUBMITTAL: SCEW(S): B-1, B-2 [33]

FUNCTION (PLANT ID): REACTOR CLEANUP OUTLET ISOLATION VALVE (IV 33-01, -02)

LICENSEE SUBMITTAL: SCEW(S): B-17, 19 [33]

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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Summary of Licensee Responses to the NRC SER

1b

Equipment Environmental Qualification Summary Forms

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Licensee Response to NRC SER

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System Consideration Review

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Equipment Environmental Qualification Review

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Installed TMI Lessons Learned Implementation
Equipment Summary

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Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <u>(I.b)</u> Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.

NOTE 2 ☐ Qualification assessment ongoing.

NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.

NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.

NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.

NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.

NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.

NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ITEM NO. 3
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT
LIMITORQUE MODEL SMB3
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 3
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CORE SPRAY LOOP 11 INLET ISOLATION VALVE B (IV 40-11, -10)
LICENSEE SUBMITTAL: SCEW(S): F-5, F-6 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.

NOTE 2 ☐ Qualification assessment ongoing.

NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.

NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.

NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.

NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.

NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.

NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ITEM NO. 4
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 4
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): CORE SPRAY BYPASS ISOLATION VALVE (IV-40-05, IV 40-06)
LICENSEE SUBMITTAL: SCEW(S): F-4, F-15 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, X , X , X
System Consideration Review	X , X , X , X , X , X
Equipment Environmental Qualification Review	X , X , X , X , X , 5f, 5g, X , X , X
Installed TMI Lessons Learned Implementation Equipment Summary	X X
Maintenance and Replacement Schedule Summary	X , X , X



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

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.

☐ 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



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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	_____
Aging Degradation Evaluated Adequately	<u>X</u>
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u>
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	<u>X</u>
III.a	Equipment Exempt From Qualification	_____
III.b	Equipment Not in the Scope of the Qualification Review	_____
IV	Documentation Not Made Available	_____

See Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

LICENSEE RESPONSE TO NRC SER [14]

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

"X" DENOTES APPROPRIATE EVALUATION

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED.

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.
(NOTE 1)

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee Reference 22^[3] identifies a letter from Limitorque dated Sept. 28, 1981. This letter was not submitted for review.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimens in PGR # 662, the thermal aging performed does not simulate a 40 year life. The statement made in the "Conclusions" section of the report, "...The unit is qualified for a 40 year life as described in the aging criteria." is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...) and no analysis of the effects of aging in steam atmosphere, as opposed to air oven aging, is presented.

CONCLUSION:

This equipment is assigned to NRC Qualification Category II-C because aging degradation has not been evaluated adequately and a conservative qualified life estimate has not been calculated.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ITEM NO. 5
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT SPRAY HEAT EXCHANGER AREA
LIMITORQUE MODEL SMBO
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 5
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): CONTAINMENT SPRAY HEAT EXCHANGER WATER ISOLATION (IV
93-27, IV 93-28, IV 93-26, IV 93-25, IV 93-50, IV 93-49)
LICENSEE SUBMITTAL: SCEW(S): N-11 THROUGH N-16 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

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.
- ☒ 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



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FRC Task No. 406

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

Documented Evidence of Qualification Adequate	<u>X</u>
Adequate Similarity Between Equipment and Test Specimen Established	<u>X</u>
Aging Degradation Evaluated Adequately	<u>X</u>
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u>
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	<u>X</u>
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 Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER [14]

☐ Qualified

☒ Qualification Assessment On-Going

☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee Reference 22[33] identifies a letter from Limitorque dated Sept. 28, 1981 which was not submitted for review.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimens in PGR # 662, the thermal aging performed does not simulate a 40 year life. The statement made in the "Conclusions" section of the report, "...The unit is qualified for a 40 year life as described in the aging criteria," is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, "10°C Rule...") and no analysis of the effects of aging in steam atmosphere, as opposed to air oven aging, is presented.

CONCLUSION:

This equipment is assigned to NRC Qualification Category II.a because adequate similarity has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ITEM NO. 6

MOTORIZED VALVE ACTUATOR LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE

LIMITORQUE MODEL SMB2

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 6

LICENSEE REFERENCE(S): 43

FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE (IV 39-08, IV 39-07, IV 39-09)

LICENSEE SUBMITTAL: SCEW(S): B-1, B-9, B-11 [33]

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

R, T, Q1, 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, X , X
System Consideration Review	X , X , X , X , X , X
Equipment Environmental Qualification Review	X , X , X , X , X , 5f, X , X , X , X
Installed TMI Lessons Learned Implementation Equipment Summary	X X
Maintenance and Replacement Schedule Summary	X X X



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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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

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) _____
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 Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER [14]

☐ Qualified

☒ Qualification Assessment On-Going

☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee Reference 24^[33], a letter from Limitorque dated Sept. 9, 1981, was not submitted for review.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ITEM NO. 7

MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT

LIMITORQUE MODEL SMB; SIZES 000, 2, 3

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 7

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): DRYWELL EQUIPMENT DRAIN PUMP DISCHARGE ISOLATION VALVE
(IV 83.1-09, -11)

LICENSEE SUBMITTAL: SCEW(S): D-4, D-5 [33]

FUNCTION (PLANT ID): CORE SPRAY LOOP #12 INLET ISOLATION VALVE A VALVE OPERATION
(IV 40-09, -01)

LICENSEE SUBMITTAL: SCEW(S): F-17, F-16 [33]

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

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Equipment Item

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Summary of Licensee Responses to the NRC SER

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <u>I.b</u> Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

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 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 8

MOTORIZED VALVE ACTUATOR LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE

LIMITORQUE MODEL SMB; SIZES 000, 2

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 8

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE (IV 39-10)

LICENSEE SUBMITTAL: SCEW(S): B-12 [33]

FUNCTION (PLANT ID): DRYWELL N2 VENTILATION & FILL ISOLATION VALVE (IV 201-31)

LICENSEE SUBMITTAL: SCEW(S): D-9 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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.
- ☒ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u> X </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

See Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER [14]

☐ Qualified

☒ Qualification Assessment On-Going

☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. B

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. B

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee Reference 22^[3] identifies a letter from Limitorque dated Sept. 28, 1981 which was not submitted.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimens in PGR # 662, the thermal aging performed does not simulate a 40 year life. The statement made in the "Conclusions" section of the report, "...The unit is qualified for a 40 year life as described in the aging criteria." is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...) and no analysis of the effects of aging in steam atmosphere, as opposed to air, over aging, is presented.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.a because adequate similarity has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ITEM NO. 9

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING
LIMITORQUE MODEL SMB000

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 9

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): VENTILATION & PURGE ISOLATION VALVE OPERATION (IV 201-07)

LICENSEE SUBMITTAL: SCEW(S): E-1 [33]

FUNCTION (PLANT ID): DRYWELL AIR VENTILATION & PURGE ISOLATION VALVE
OPERATION (IV 201-09)

LICENSEE SUBMITTAL: SCEW(S): D-2 [33]

FUNCTION (PLANT ID): VENTILATION & PURGE ISOLATION VALVE OPERATION (IV 201-17)

LICENSEE SUBMITTAL: SCEW(S): E-8 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

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

- ☒ The Licensee (~~has~~) 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)
- ☐ 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



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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	_____
Aging Degradation Evaluated Adequately	<u>X</u> _____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u> _____
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	<u>X</u> _____
III.a	Equipment Exempt From Qualification	_____
III.b	Equipment Not in the Scope of the Qualification Review	_____
IV	Documentation Not Made Available	_____

See Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER [14]

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61KF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☒ Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

"X" DENOTES APPROPRIATE EVALUATION

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED.

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE. (NOTE 1)

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. Licensee Reference 22[5] identifies a letter from Limitorque dated Sept. 28, 1981 which was not submitted for review.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimens in PGR # 662, the thermal aging performed does not simulate a 40 year life. The statement made in the "Conclusions" section of the report, "...The unit is qualified for a 40 year life as described in the aging criteria," is unsounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...) and no analysis of the effects of aging in steam atmosphere, as opposed to air oven aging, is presented.

CONCLUSION:

This equipment is assigned to NRC Qualification Category II-C because aging degradation has not been evaluated adequately and a conservative qualified life estimate has not been calculated.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ITEM NO. 10

SOLENOID VALVE LOCATED IN THE REACTOR BUILDING

LAWRENCE MODEL 26DCSWPS

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 10

LICENSEE REFERENCE(S): 23

FUNCTION (PLANT ID): DRYWELL OXYGEN SAMPLING VALVE (IV 201.2-26, IV 201.2-29,
IV 201.2-25, IV 201.2-23, IV 201.2-24, IV 201.2-30,
IV 201.2-28, IV 201.2-27)

LICENSEE SUBMITTAL: SCEW(S): D-17 THROUGH D-22, E-9, E-10 [33]

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, LXN, 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:

- ☒ 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 (Qualification Assessment On-going)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

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. 10

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component
- [14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 364F and 8300 361YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

NOTES:

Reference 23 contains vendor data on the Lawrence 500 and 500 HP series solenoid valves. The licensee has not presented documented evidence of qualification for this equipment.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ITEM NO. 11

SOLENOID VALVE LOCATED IN THE STEAM TUNNEL

DECCO MODEL 24166

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 11

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MAIN STEAM BYPASS ISOLATED VALVE (SV 01-05, SV 01-06)

LICENSEE SUBMITTAL: SCEW(S): D-6, B-P [33]

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 266

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

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.
- ☒ 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 (REPLACEMENT IE QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ITEM NO. 12
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
DECCO MODEL 24166
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT SPRAY INLET ISOLATION VALVE (SV 80-36,
SV 80-16, SV 80-35, SV 80-15)
LICENSEE SUBMITTAL: SCEW(S): D-1, D-14, D-15, D-16 [33]

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



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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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



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FPC Project No. C5257
FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

EQUIPMENT ITEM NO. 13
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
ASCO MODEL HVA904058A
REQUIRED OPERATING TIME: 28 HOUR
TER CHECKSHEET NO. 13
LICENSEE REFERENCE(S): 24, 4673
FUNCTION (PLANT ID): CONTROL ROD DRIVE SCRAM DUMP CONTROL (SV NC-15A,
SV NC-16A, SV NC-15B, SV NC-16B)
LICENSEE SUBMITTAL: SCEW(S): R-1 THROUGH R-4 [33]

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, (M), 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
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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



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FRC Task No. 4660

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

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.

☒ 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 (Replacement if qualification can not be substantiated)

☐ 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



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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	<u>X</u> _____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u> _____
Program Established to Identify Aging Degradation	_____
Criteria Regarding Aging Simulation Satisfied (If Required) --	<u>X</u> _____
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	<u>X</u> _____
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. 13

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☐ Qualification Assessment On-Going
☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

Reference 4673 (QSR-097-A-01) is a summary report of testing performed by ASCO on their HVA-90 series valves. Testing consisted of exposure to a high temperature/humidity/pressure environment for 6 hours. The report concludes that the valves remained operable throughout the test program with no significant degradation in performance. The test valves were not thermal, radiation or operationally aged prior to testing, and a qualified life estimate has not been established for this equipment.

Reference 24 is an analysis performed by NKS corp. in which the following recommendation was made:

12.0 " RECOMMENDATION

- o Subject equipments to be replaced with qualified equipments

Since there is no data available for the life of the class "B" coil, it is not possible to set up a maintenance program to replace the coil. Therefore, the subject equipment should be replaced."



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

It is noted that the licensee has claimed a 12 year qualified life for this equipment based on a limited material analysis provided in reference 24.

The recommendation made above has not been incorporated into the licensee response.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 14

SOLENOID VALVE LOCATED IN THE CONTAINMENT

GENERAL ELECTRIC MODEL 1525VX

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 14

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): VALVE PILOT AND POSITION SWITCH (POS NR-108A THROUGH NR-108F)

LICENSEE SUBMITTAL: SCEW(S): C-3 THROUGH C-8 [33]

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 Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
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Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <u>I.b</u> Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ITEM NO. 15
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
ASCO MODEL 8300B61RU
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 15
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TORUS N2 MAKEUP AND BLEED VALVE CONTROL (SV 201.2-06,
SV 201.2-33)
LICENSEE SUBMITTAL: SCEW(S): E-4, E-6 [33]

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

R, T, (T), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☐ Qualification Assessment On-Going
☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ITEM NO. 16

SOLENOID VALVE LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE

ASCO MODEL WPLB300B72F

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 16

LICENSEE REFERENCE(S): 1552, 24

FUNCTION (PLANT ID): DRYWELL N2 MAKEUP AND BLEED VALVE OPERATION
(SV 201.2-32, SV 201.2-03)

LICENSEE SUBMITTAL: SCEW(S): D-10, D-12 [33]

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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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.
- ☒ 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 (REPLACEMENT IF QUALIFICATION CANNOT BE SUBSTANTIATED)
- ☐ 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 1ER 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)

DESIGNATION:

X = CATEGORY

NRC QUALIFICATION 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☐ Qualification Assessment On-Going
☒ To be Replaced by a Qualified Component

[14] --

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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.)
<u>EQUIPMENT DESCRIPTION</u> Equipment Type	SOLENOID VALVE	SOLENOID VALVE	
Manufacturer's Name (.2.2/-/-)	ASCO	AUTOMATIC VALVE CORPORATION	
Model Number (5.2.2/-/-)	WPLB 8300B7ZF;	C-5450	X
Serial Number	WPLB 8300B68F		NOTE 3
Features/Mounting (5.2.6/-/-)		1/2 IN. VITON SEALS	
Connections/Interfaces (5.2.6/-/-)	NOT STATED		
Location/Elevation	REACTOR BLDG and Emergency Condenser Isolation		SEE NOTE 4
Equipment ID No.	Valve Cubicle (298')		
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PED MEMO 126-62	PED MEMO 126-62	
Report Date			
Issued by			
Prepared for		GENERAL ELECTRIC CO.	
Referenced Reports			
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST	
<u>QUALIFICATION TEST PROGRAM</u> Functional Test Description (5.2.5/2.2.9/2.2.9)		MIN. SHIFT PRESSURE; LEAKAGE CHECKS	
Operating Conditions (-/2.2.10/2.2.10)			
Load/Cycles/Voltage/ Current/Freq.		106 VDC 90 PSIG N ₂	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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 TESTING	
Accuracy (5.2.5/-/-)			
Number of Specimens			
Test Instruments Calibrated		NOT STATED	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Dry well N ₂ makeup & bleed valve operation		
Test Duration (5.2.1/-/-)			
Accident Duration (Envir. Above Normal) (5.2.1/-/-)			
Required Function Time	1 hr.		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)			
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		RAD/OPER/DBE 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			
Material Aging Evaluation (7.0/-/-)		NOT PERFORMED	X NOTE 1
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)			
Radiation Aging, Type			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)		Included in accident dose	
Radiation Aging, Dose Rate			
Radiation Aging, Method			
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)			
Operational Aging (-/4.2/-)		200 cycles	
Other Age Conditioning (-/4.2/-)			
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12 yr.	ND	
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/-/-)			
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB	LOCA	
Radiation Type		GAMMA --	
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.8×10^5 rd.	3.0×10^7 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/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	9.8×10^5 rd.	3.0×10^7 rd.	
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I, 0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase		NOT STATED	
Peak: °F/psig/RH/Time	305/9/-/40 sec	340/65/100/2 MIN.	
Decrease To: °F/psig/RH/Time	385/0/-/41 hr	340/45/100/3 HR	
Decrease To: °F/psig/RH/Time	160/0/-/1 →	320/45/100/3 HR.	
Decrease To: °F/psig/RH/Time		250/25/100/2 HR.	
Equipment Surface Tempera- ture (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)	NA	NOT PERFORMED	NOTE 1
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	NA		
Spray Density (gpm/ft ²)	NA		
Spray Duration	NA		
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. 16

NOTES:

1. No thermal aging or chemical spray was performed for the test program.

2. Reference 24 is an analysis performed by NUS corp. in which the following recommendation was made:

12.0 "RECOMMENDATION

Subject equipments to be replaced with qualified equipments

Since there is no data available for the life of the class "B" coil, it is not possible to set up a maintenance program to replace the coil. Therefore, the subject equipment should be replaced."

It is noted that the licensee has claimed a 12 years qualified life for this equipment based on the limited materials analysis provided in ref. 24.

3. Reference 1552 is test documentation on Automatic Valve Corporation solenoid valves, no similarity between the installed/tested equipment has been established.

4.	model no.	WPLB 8300 BT2F	WPLB 8300 B68 F
	plant I.D. no.	SV 201.2-32	SV 68-07C, -08C, -10C
		SV 201.2-03	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ITEM NO. 17
SOLENOID VALVE LOCATED IN THE EMERGENCY CONDENSER RETURN VALVE AREA
ASCO MODEL 8300 SERIES
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 17
LICENSEE REFERENCE(S): 1552, 4025
FUNCTION (PLANT ID): EMERGENCY CONDENSER VALVE PILOT (SV 39-06, SV 39-05)
LICENSEE SUBMITTAL: SCEW(S): B-H[33]
B-15

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. 17

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.
- ☒ 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 (Replacement if qual. can not be substantiated.)
- ☐ 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



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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	<u>X</u>
Aging Degradation Evaluated Adequately	<u>X</u>
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u>
Program Established to Identify Aging Degradation	<u>X</u>
Criteria Regarding Aging Simulation Satisfied (If Required)	<u>X</u>
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	<u>X</u>
Criteria Regarding Test Sequence Satisfied	_____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	_____
Criteria Regarding Functional Testing Satisfied	<u>X</u>
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	<u>X</u>
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. 16 for review of
reference 1552.*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
☐ Qualification Assessment On-Going
☒ To be Replaced by a Qualified Component [14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☒ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 364F and 8300 361YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

NOTES:

Reference 4025 is a summary report of Masonic International report no. 1003. The testing consisted of LOCA simulation of 310°F, 65 psig, and a 6% acetic acid solution spray. The equipment tested was identified as an ASCO series 8300 (a model WPHT8300BG1YF).

It is noted that the test did not include any thermal, radiation, or operational aging. There was no information regarding functional testing or auditable data presented.

The reference report made the following conclusions:

CONCLUSIONS:

The above simulated LOCA tests exceeded the combined time, pressure and temperature exposure expected in the containment area. Based on the excess test conditions and the performance of the equipment during test it is safe to say the Asco Solenoids WPHTX8320A21V, Serial No. 96578A, WPHT8300B61YF, Serial No. 96577A, Ramco Limit Switch #EA-740-500-00 and Masonic Model #77-4 Airset will continue to perform during and after a Loss of Operating Coolant accident.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
ASCO MODEL WPLB8300B68F
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 18
LICENSEE REFERENCE(S): 1552, 24
FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE OPERATOR (SV 68-09C, -08C,
-10C)
LICENSEE SUBMITTAL: SCEW(S): E-15 [33]

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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Installed TMI Lessons Learned Implementation	6a, 6b
Equipment Summary	
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

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.
- ☒ 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 (Replacement if qual. can not be substantiated.)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u>X</u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

See equipment item no. 16 for detailed evaluation.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION IN REVIEW OF EQUIPMENT ITEM NO. 18

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going.
- ☒ To be Replaced by a Qualified Component [14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YP.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ITEM NO. 19

TRIP UNIT LOCATED IN THE REACTOR BUILDING

ROSEMOUNT MODEL 510DU

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 19

LICENSEE REFERENCE(S): 22

FUNCTION (PLANT ID): DRYWELL PRESSURE TRIP TO RPS (201.2-476A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): H-21 THROUGH H-24 [33]

FUNCTION (PLANT ID): EMERGENCY CONDENSER FLOW TRIP TO RPS (36-06A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): H-25 THROUGH H-28 [33]

FUNCTION (PLANT ID): STEAM LINE FLOW TRIP TO RPS (01-26A THROUGH H)

LICENSEE SUBMITTAL: SCEW(S): H-29 THROUGH H-36 [33]

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 Review

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5m, 5n, 5o, 5p, 5q, 5a,
6a, 6b 5b, 5c, 5d, 5e,
5f, 5g, 5h, 5i,
5j, 5k, 5l, 5m,
7a, 7b, 7c 5n, 5o, 5p,
5q

Installed TMI Lessons Learned Implementation
Equipment Summary

Maintenance and Replacement Schedule Summary



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

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.
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a Qualification Not Established</u> | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

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) _____
Program Established to Identify Aging Degradation _____
Criteria Regarding Aging Simulation Satisfied (If Required) _____
Criteria Regarding Temperature/Pressure Exposure: _____
 o Peak Temperature Adequate X
 o Peak Pressure Adequate _____
 o Duration Adequate _____
 o Required Profile Enveloped Adequately X
 o Steam Exposure (If Required) Adequate _____
Criteria Regarding Spray Satisfied _____
Criteria Regarding Submergence Satisfied X
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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

Checksheets 5 thru 5g & 5a thru 5g have been removed due to the
proprietary nature of information contained therein.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ITEM NO. 20

TRIP UNIT LOCATED IN THE REACTOR BUILDING

ROSEMOUNT MODEL 510DU

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 20

LICENSEE REFERENCE(S): 22

FUNCTION (PLANT ID): REACTOR LEVEL TRIP UNIT (36-03A, C, D; 36-04A, B, C, D;
36-05A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): G-17 THROUGH 28; G-36 THROUGH G-40 [33]

FUNCTION (PLANT ID): REACTOR PRESSURE TRIP UNIT PRESSURE TRIP
(36-07A, B, C, D; 36-08A, B, C, D) --

LICENSEE SUBMITTAL: SCEW(S): G-28 THROUGH G-36; G-40 THROUGH G-48 [33]

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 REVIEW OF EQUIPMENT ITEM NO. 20

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.
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a Qualification Not Established</u> | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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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	<u>X</u> _____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u> _____
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	<u>X</u> _____
o Duration Adequate	_____
o Required Profile Enveloped Adequately	_____
o Steam Exposure (If Required) Adequate	<u>X</u> _____
Criteria Regarding Spray Satisfied	_____
Criteria Regarding Submergence Satisfied	_____
Criteria Regarding Radiation Satisfied	<u>X</u> _____
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	<u>X</u> _____
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 19 for full evaluation details.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

LICENSEE RESPONSE TO NRC SER

X Qualified

___ Qualification Assessment On-Going

___ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ITEM NO. 21
TRANSDUCER, E/P LOCATED IN THE REACTOR BUILDING
FISHER CONTROLS MODEL 546 4154882
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 21
LICENSEE REFERENCE(S): 4719, 29
FUNCTION (PLANT ID): OPERATES TEMPERATURE CONTROL VALVE (E/P 70-137)
LICENSEE SUBMITTAL: SCEW(S): J-4 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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) _____
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 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1 Component Review Summary Sheet

Equipment: Electropneumatic Transducer (E/P 70-137)
Manufacturer: Fisher
Model: Type S46
Safety Function: Reactor Building closed loop cooling (RBCLC) temperature control
Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The electropneumatic transducer controls modulating valves for reactor closed loop cooling system temperature control. The position of three valves, RBCLC heat exchanger bypass, RBCLC heat exchanger inlet and the service water heat exchanger outlet valves are controlled through the transducer to maintain set temperature. Loss of electrical signal will cause the RBCLC heat exchanger bypass valve to its maximum opening; RBCLC heat exchanger inlet valve closed and the service water heat exchanger outlet valve to its min. flow condition. Loss of motive air causes the RBCLC valves to fail as is and the service water valve fails full open. With loss of control air the valves revert to full cooling position.

The reactor building closed loop cooling system is in continual operation during normal power operating conditions. Any age-related failure associated with the electropneumatic transducer would be apparent to the operator as a result of numerous temperature alarms.

Based on the above, continued operation is justified until the electropneumatic transducer is qualified or replaced with a qualified device.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61VF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	E/P TRANSDUCER	ELECTRO-PNEUMATIC TRANSDUCER	
Manufacturer's Name (5.2.2/-/-)	FISHER CONTROLS	FISHER CONTROLS	
Model Number (5.2.2/-/-)	546-4154882	TYPE 546-MODEL 4154882	
Serial Number	NOT STATED	NOT STATED	
Features/Mounting (5.2.6/-/-)	NOT STATED	YOKE-MOUNTING BKT	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	NOT STATED	
Location/Elevation	REACT. BLDG.	—	
Equipment ID No.	5/P 70-137	—	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PSR #298 AGR #4719	1961-F135-001 (PSR 29) 12/11/81	NOTE 1
Report Date		NUS CORP. FOR HMPC	
Issued by		NA-23 (AGR 4719) 2/16/81	NOTE 2
Prepared for		FISHER CONTROLS	
Referenced Reports			
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST & ANALYSIS	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		OPERATIONAL TESTS	NOTE 2-
Operating Conditions (-/2.2.10/2.2.10)		NOT STATED	
Load/Cycles/Voltage/ Current/Freq.			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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)		$\pm 0.5\%$ INDEPENDENT LINEARITY & 1% TER- MINAL BASED LINEAR- ITY	NOTE 2
Accuracy (5.2.5/-/-)		1	
Number of Specimens		NOT STATED	
Test Instruments Calibrated			
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	ACTIVE		NOTE 2
Test Duration (5.2.1/-/-)	—	13 HRS — STEAM EXP. 25 DAYS — Aging	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	15 HOURS		
Required Function Time	28 HOURS	13 HOURS	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	COMBINED T/P/H	NOTE 1
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			NOTE 1
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			NOTE 1
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0)			NOTE 1
Thermal Aging/Basis		ARRHENIUS MODEL	
Material Aging Evaluation (7.0/-/-)		NOT PERFORMED	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		BUNA'N' O-RINGS & DIAPHRAGM	
Radiation Aging, Type		NOT STATED	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.4 E06	1.4 E06	NOTE 3, X
Radiation Aging, Dose Rate	NOT STATED	NOT STATED	
Radiation Aging, Method	ANALYSIS	ANALYSIS / TEST	NOTE 1, 2
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		BUNA 'N'	
Operational Aging (-/4.2/-)		25000 cycles for 25 days at 220°F	NOTE 2
Other Age Conditioning (-/4.2/-)		TEMP. CYCLING: +70°F/ -150°F / +20°F / +70°F	NOTE 2
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12.5 YRS.	12.5 YRS	NOTE 4, X
Normal Ambient Temperature Normal Ambient Radiation 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/-)			
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB	HELB/LOCA	
Radiation Type	NOT STATED	NOT STATED --	
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.8E05	SEE RADIATION AGING	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED ANALYSIS	— ANALYSIS	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED		
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>	:	:	:
Rate of Temp./Press. Increase	: <i>NOT STATED</i> :	: <i>NOT STATED</i> :	:
Peak: °F/psig/RH/Time	: <i>307/1.0/100/103</i> :	: <i>320/75.3/100/1 HR</i> :	:
Decrease To: °F/psig/RH/Time	: <i>140/1.0/100/15 HR</i> :	: <i>288/71.3/100/12 HR</i> :	:
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)	: <i>N/A</i> :	:	:
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	:	:	:
Spray Density (gpm/ft ²)	:	:	:
Spray Duration	:	:	:
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. 21

NOTES:

1) PRR #29 consists of an evaluation of the Fisher Controls type 546 electro-pneumatic transducer for thermal aging, radiation, and operation in a harsh environment (HOS or H-16). PRR #4719 (Fisher Controls report NA-23, dated 2/16/81) is included among the references cited in PRR #29.

The radiation evaluation consisted of a literature search to determine the threshold levels for the organic materials known to be employed in the transducer. Regarding the materials comprising the transducer, PRR #29 states the following:

"A LIST OF NON-METALLIC MATERIALS WAS NOT OBTAINED FROM THE MANUFACTURER OF THE SUBJECT TRANSDUCER. HOWEVER FOR THESE NON-METALLIC COMPONENTS KNOWN TO BE INCLUDED IN THE CONSTRUCTION OF THE TRANSDUCER (SEE PARAGRAPH 6.3 THIS ANALYSIS), A LITERATURE SEARCH WAS CONDUCTED TO OBTAIN RADIATION AND TEMPERATURE THRESHOLD LEVELS, AND TIME/TEMPERATURE AGING DATA, FOR THESE MATERIALS THAT MAY BE SUBJECT TO DEGRADATION FROM THESE FACTORS."

Nitrile rubber (BUNA 'N'), determined from PRR 4719 to be used in the transducer, was assumed in the analysis to be the limiting organic material and therefore formed the basis for the radiation evaluation. A threshold of 1.4×10^6 RADS for the BUNA 'N' was established, and NUS report NUS-LA-A-001, dated 11/23/81, was cited as the data source for this value.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES:

NOTE 1 CONTINUED

The thermal aging life was estimated using an Arrhenius model and considering PUNA 'N' as the only known non-metallic material in the type 546 transducer. An estimated thermal-aging life at ambient conditions of 12.5 years and an operating life of 79.12 hours in a harsh environment (temperature) was developed for the transducer.

Regarding qualification to a harsh environment the report states the following:

"SUBJECT TO A REGULARLY SCHEDULED REPLACEMENT PROGRAM FOR THE AGE SENSITIVE MATERIALS, IT CAN BE CONCLUDED THAT BASED ON THE HARSH ENVIRONMENT TEST, (REF 1) THE TRANSDUCER IS QUALIFIED FOR A HARSH ENVIRONMENT OF 300°F, 75.3 PSIG PRESSURE. THESE VALUES ARE IN EXCESS OF THE 300°F, 9 PSIG HARSH ENVIRONMENT CONDITIONS TO WHICH THE TRANSDUCER COULD BE EXPOSED TO AT NMP-1."

(Ref. 2) - PGR #4719

The report concludes with the recommendation that the PUNA 'N' components be replaced approximately every 5 years to be safe and conservative.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES:

2) FGR #4719 is a summary report covering the results of environmental testing of a type 546 transducer and a type 67FR regulator, including (a) vibration, (b) temperature cycling, (c) steam exposure, (d) combined heat aging, mechanical aging, radiation exposure and vibratory input. The temperature cycling consisted of exposure of a type 546 transducer to four consecutive derivation cycles at $+70^{\circ}\text{F}$, $+150^{\circ}\text{F}$, $+220^{\circ}\text{F}$ and $+70^{\circ}\text{F}$ with no adverse effects noted. Tests (c) & (d) were as follows:

(c) "The Type 546 transducer was tested for one hour in a 320°F (75.3 psig) saturated steam atmosphere and then for 12 more hours with the steam temperature lowered to 288°F (41.3 psig). The transducer was exercised after the first hour and also several times thereafter during the 13 hour test period. Operation was observed and recorded on equipment outside the test chamber.

Throughout the test the 546 remained functional and was still operating and in very good physical condition at the completion of the test. After the test, the span of the unit was unchanged, but there was a zero shift of about 3.3 psig. The test report concludes that the 546 transducer would function both during and after an environmental atmosphere (as described) for up to 13 hours."

(d) "A complete control valve assembly that included a Type 546 transducer was tested as part of a specific customer's qualification program. The aging tests are documented in Fisher Lab Problem 1667, Report 62A, and included 27,000 operational cycles at 220°F during a 25-day period. Following the aging procedures, the transducer was still functional, although set point shifts of -3.6% (valve opening) and -11.8% (valve closing) were observed.

After re-calibrating the transducer to compensate for the temperature-induced zero shift, the valve assembly was irradiated to 10.5 megrads and then subjected to seismic vibration testing."

The report concludes with the following statement:

"The Fisher Type 546 electro-pneumatic transducer was originally designed, and is currently sold, as a commercial product, without regard to IEEE Class 1E equipment qualification requirements or to the sequential test procedures required for qualification in accordance with IEEE 323-1974. While this product is occasionally included as an appurtenance to a control valve intended for service in a nuclear plant application, Class 1E performance capabilities are neither stated nor intended. Fisher has no current intention of seeking 1E classification status for this product. Consequently, no operability certification will be furnished for the transducer or the associated Type 67FR supply pressure regulator for any type of seismic or environmental accident conditions as defined by IEEE."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES:

3) The radiation evaluation of the transducer did not account for the particular characteristic of the Buna 'N' as it applies to the application in the device; i.e. compressive set, elongation, etc. Further, since a materials list was not furnished, evaluation of the materials to better determine the limiting material was not possible. Therefore, this equipment item has been judged to be deficient with respect to radiation in that all the materials comprising the transducer have not been addressed.

4) The estimated life of 12.5 years was derived based on the assumption that Buna 'N' was the limiting item among the materials comprising the transducer. Since no materials list was furnished, evaluation of the materials to better determine the limiting item was not possible. Therefore, this equipment item has been judged to be deficient with respect to aging in that all the materials comprising the transducer have not been addressed.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

IT IS RECOMMENDED THAT BUNA-N COMPONENTS IN THE TIRE 546 ELECTRO-PNEUMATIC TRANSDUCER BE REPLACED ON A REGULARLY SCHEDULED BASIS. THE MAXIMUM LIFE OF BUNA-N AT NORMAL SERVICE TEMPERATURE IS CALCULATED TO BE APPROXIMATELY 19.5 YEARS. THESE COMPONENTS SHOULD BE REPLACED APPROXIMATELY EVERY FIVE YEARS TO BE SAFE AND CONSERVATIVE.



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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 22

THERMOCOUPLE LOCATED IN THE REACTOR BUILDING

PALL TRINITY MICRO MODEL TYPE CU/6

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 22

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RBCLC HEAT EXCHANGE OUTLET TEMPERATURE CONTROL (TE 70-23)

LICENSEE SUBMITTAL: SCEW(S): J-5 [33]

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

R, T, QI, 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

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System Consideration Review

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Equipment Environmental Qualification Review

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Installed TMI Lessons Learned Implementation
Equipment Summary

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Maintenance and Replacement Schedule Summary

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FRC Task No. 266

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>I.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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



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FRC Assignment No. 13

FRC Task No. 4C6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going.
- ☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ITEM NO. 23

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"

GE/MAC MODEL 551

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 23

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TRANSMITS CONTAINMENT SPRAY PUMP DISCHARGE PRESSURE (PT
80-75)

LICENSEE SUBMITTAL: SCEW(S): N-4 [33]

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~~



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FRC Task No. 4166

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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.
- ☒ 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 (Equipment replacement is qual. cannot be substantiated)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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 _____
 Operation 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 24

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"

GE/MAC MODEL 551 4532K11001

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 24

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TRANSMITS CONTAINMENT SPRAY PUMP DISCHARGE PRESSURE
(PT 80-69, 80-47, 80-54)

LICENSEE SUBMITTAL: SCEW(S): N-1, N-2, N-3 [33]

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, (Q1), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <u>I.b</u> Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ITEM NO. 25

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

GE/MAC MODEL 551 JB394616611

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 25

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PRESSURE INDICATION (PT ID-46A, B)

LICENSEE SUBMITTAL: SCEW(S): G-1, G-2 [33]

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

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Licensee Response to NRC SER

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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. 25

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.
- ☒ 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 (Equipment replacement if qualification can not be substantiated)
- ☐ 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



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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 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 15 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ITEM NO. 26

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

GE/MAC MODEL 551 LB484611175

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 26

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PRESSURE INDICATION (PT ID-45)

LICENSEE SUBMITTAL: SCEW(S): G-3 [33]

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

R, T, QI, 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~~



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FRC Task No. 4166

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 216

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.
- ☒ 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 (Equipment replacement is qual. can not be substantiated)
- ☐ 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



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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 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. 26

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ITEM NO. 27

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
ROSEMOUNT MODEL 1151

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 27

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR PRESSURE MEASUREMENT (PT 36-07A, B, C, D;
36-08A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): G-49 THROUGH G-56 [33]

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

R, T, QI, 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

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System Consideration Review

~~4a, 4b, 4c, 4d, 4e, 4f~~

Equipment Environmental Qualification Review

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~~5g, 5h, 5i, 5j~~

Installed TMI Lessons Learned Implementation
Equipment Summary

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Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14-]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1 -
Component Review Summary Sheet

Equipment: Reactor pressure transmitter 36-07 A-0
Manufacturer: Rosemount
Model: 1151 DP
Safety Function: Initiates reactor scram and turbine stop valve closure on high reactor pressure

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The transmitters monitor reactor pressure and initiate protective action on high reactor vessel pressure. As a result of a high energy line break or loss of coolant accident, initiation of protective action occurs within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.

NOTE 2 X Qualification assessment ongoing.

NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.

NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.

NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.

NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.

NOTE 7 — Further equipment identification needed to assure applicability of test report.

NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ITEM NO. 28
TEMPERATURE SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
FENWAL MODEL 1700240
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 28
LICENSEE REFERENCE(S): 827, 28
FUNCTION (PLANT ID): MAIN STEAM LINE TO RPS (TS 1B-10A THROUGH H, J THROUGH
N, P, Q, R)
LICENSEE SUBMITTAL: SCEW(S): H-1 THROUGH H-16 [33]

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 REVIEW OF EQUIPMENT ITEM NO. 28

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.
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification: | III.a Exempt |
| <u>II.a Qualification Not Established</u> | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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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	<u>X</u>
Aging Degradation Evaluated Adequately	<u>X</u>
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u>
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	<u>X</u>
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	<u>X</u>
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	<u>X</u>
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

LICENSEE RESPONSE TO NRC SER

X Qualified

 Qualification Assessment On-Going

 To be Replaced by a Qualified Component :



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

Checksheets 5a thru 5p have been removed due to the
proprietary nature of information contained therein.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ITEM NO. 29

D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

ROSEMOUNT MODEL 1151DP 7E22T0003PB

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 29

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MEASURES RPS STEAM FLOW (DPT 36-06A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): M-1 THROUGH M-4 [33]

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

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

Not stated, Not applicable

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System Consideration Review

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Equipment Environmental Qualification Review

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5g, 5h, 5i, 5j~~

Installed TMI Lessons Learned Implementation
Equipment Summary

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Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ITEM NO. 30

D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

ROSEMOUNT MODEL 1151DP

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 30

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MEASURES RPS DRYWELL PRESSURE (DPT 201.2-476A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): N-17 THROUGH N-20 [33]

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, LM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Summary of Licensee Responses to the NRC SER

1b

Equipment Environmental Qualification Summary Forms

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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~~



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FRC Assignment No. 13

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982

Nine Mile Point Unit 1
Component Review Summary Sheet

[33]

Equipment: Drywell pressure transmitter 201.2-476 A-D
Manufacturer: Rosemount
Model: 1151 DP
Safety Function: Reactor scram, drywell isolation, containment spray, core spray, auto depress

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The transmitters monitor drywell pressure and initiate protective action on high drywell pressure condition. As a result of a high energy line break or loss of coolant accident, initiation of protective action occurs within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ITEM NO. 31

D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"

ROSEMOUNT MODEL 1151DP 7E2ZT0003PB

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 31

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MEASURES RPS STEAM FLOW (DPT 01-26A THROUGH H)

LICENSEE SUBMITTAL: SCEW(S): H-38 THROUGH H-44 [33]

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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Summary of Licensee Responses to the NRC SER

1b

Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

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.
- ☒ 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 (Qualification Assessment On-going)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1980

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Main steam flow differential pressure transmitter 01-26 1-W

Manufacturer: Rosemount

Model: 1151 DP

Safety Function: Main steam line isolation on high steam line flow

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The transmitters monitor main steam line flow and initiate protective action on high main steam line flow condition. As a result of a high energy line break or loss of coolant accident, initiation of protective action occurs within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YP.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ITEM NO. 32

TEMPERATURE ELEMENT LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE
CUBICLE, ELEV 281' 0"

MINCO NICKEL, MODEL NOT STATED

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 32

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EMERGENCY CONDENSER RETURN LINE BREAK DETECTION
(TE IBO6-13, -14, -23, -24)

LICENSEE SUBMITTAL: SCEW(S): M-5 THROUGH M-8 [33]

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

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Equipment Environmental Qualification Summary Forms

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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~~



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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.
- ☒ 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 (Qualification Assessment ON-going)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ITEM NO. 33

PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

MERCOID MODEL SD8136 SERIES L5432R21E

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 33

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT STRAY LOW PRESSURE ALARM (PS 80-61, -60)

LICENSEE SUBMITTAL: SCEW(S): N-9, N-10 [32]

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

R, T, Q1, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

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

- ☒ The Licensee (has/~~has not~~) provided a response to the SER con/ ns.
- ☐ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ITEM NO. 34
PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
MERCID MODEL DA5432
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 34
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CORE SPRAY PRESSURE ALARM (PS-40-80, -07)
LICENSEE SUBMITTAL: SCREW(S): F-7, F-8 [33]

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
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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	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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FRC Task No. 406

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

--
[4]

NOTES USED IN REVISION 4 [33]

NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.

NOTE 2 ☒ Qualification assessment ongoing.

NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.

NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.

NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.

NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.

NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.

NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ITEM NO. 35

LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

ROSEMOUNT MODEL 1151DP

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 35

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TRIPS TURBINE STOP VALVES (LT 36-03A, B, C, C)

LICENSEE SUBMITTAL: SCEW(S): G-4 THROUGH G-7 [33]

LICENSEE SUBMITTAL: SCEW(S): G-6 [33]

FUNCTION (PLANT ID): MEASURES LOW-LOW REACTOR LEVEL TO RPS (LT 36-04A, B, C, D; 36-05A, B, C, D) --

LICENSEE SUBMITTAL: SCEW(S): G-8 THROUGH G-15 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Reactor pressure transmitter 36-05 A-0
Manufacturer: Rosemount
Model: 1151 DP
Safety Function: Auto depressurization with high drywell pressure
Qualification Discrepancy: Lack of qualification data
Justification for Continued Operation:

The transmitters monitor reactor vessel level and initiate protective action on low reactor vessel level condition. As a result of a high energy line break or loss of coolant accident, initiation of protective action occurs within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit
Component Review Summary Sheet

Equipment: Reactor water level transmitter 35-03 A-D
Manufacturer: Rosemount
Model: 1151 DP
Safety Function: Initiates reactor scram and turbine stop valve closure on low level and turbine stop valve closure on high vessel level

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The transmitters monitor reactor water level and initiate reactor scram and/or turbine stop valve closure for off normal conditions. As a result of a high energy line break or loss of coolant accident, initiation of protective action will occur within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Reactor water level transmitter 16-Q4 A-0

Manufacturer: Rosemount

Model: 1151 DP

Safety Function: Activates core and containment spray pumps, isolates main steam line, cleanup, shutdown cooling, vent and purge, sumps and trips recirc. loops

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The transmitters monitor reactor water level and initiate protective action on low-low reactor coolant level condition. As a result of a high energy line break or loss of coolant accident, initiation of protective action occurs within a short time of the event. The transmitters will have performed their intended safety function before being subjected to substantial adverse environmental conditions.

Potential failure of these transmitters subsequent to performing their intended function would not adversely affect accident mitigation.

Based on the above, continued operation is justified until the transmitters are qualified or replaced with a documented qualified transmitters.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ITEM NO. 36
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
ROSEMOUNT MODEL 1151DP
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MEASURES TORUS WATER LEVEL (LT 58-05, -06)
LICENSEE SUBMITTAL: SCRW(S): F-9, F-10 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

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.
- ☐ 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



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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 _____

See equipment item 80

It is concluded that the Rosemount Model

1151DP will be replaced by equipment item

80.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ITEM NO. 37
CONTROL SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 236'0"
MERCOD MODEL CP4122
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE CONTROL (VCS 68-11A, B;
68-12A, B; 68-13A, B)
LICENSEE SUBMITTAL: SCEW(S): E-17 THROUGH E-22 [33]

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 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61XF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ITEM NO. 38
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
GENERAL ELECTRIC MODEL 553 HB345619079
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR LEVEL MEASUREMENT (LT IA-12)
LICENSEE SUBMITTAL: SCEW(S): G-16 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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 | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt |
| II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u>X</u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ITEM NO. 39
FLOW TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
ROSEMOUNT MODEL 1151DP
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CORE SPRAY PUMP FLOW MEASUREMENT (FT RV-26A)
SERVICE:
LICENSEE SUBMITTAL: SCEW(S): F-3 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Core spray flow transmitter RV-26A, B

Manufacturer: Rosemount

Model: 1151 DP

Safety Function: None

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The core spray flow transmitters provide no control or safety related function. They provide flow indication to the operator. Potential failure of these transmitters would not adversely affect accident mitigation.

Based on the above, continued operation is justified.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ITEM NO. 40
FLOW TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
ROSEMOUNT MODEL 1151DP 6B22LMMB
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 40
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM LINE FLOW MEASUREMENT (FT ID-33A, B)
LICENSEE SUBMITTAL: SCEW(S): C-1, C-2 [33]

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	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [4]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component --

Rev. Date April 2, 1992 [13]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Main steam flow transmitter ID 33A, 8
Manufacturer: Rosemount
Model: 1151 DP
Safety Function: None

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The main steam flow transmitters input to the feedwater control system and provide a bias signal when in three element control. The transmitters provide steam flow indication and have no safety related function. Potential failure of these transmitters would not adversely affect accident mitigation.

Based on the above, continued operation is justified.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64" and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ITEM NO. 41
ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING
GENERAL ELECTRIC MODEL 5K445AK249A CB161088
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 41
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): DRIVES CLOSED LOOP COOLING PUMPS (M70-01 THROUGH M70-03)
LICENSEE SUBMITTAL: SCEW(S): J-1 THROUGH J-3 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
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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



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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

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.
- ☒ 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 (Qualification Assessment On-Going)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ITEM NO. 42

ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"

GENERAL ELECTRIC MODEL 5K828837C7 HC8365172

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 42

LICENSEE REFERENCE(S): 4021

FUNCTION (PLANT ID): DRIVES CORE SPRAY TOPPING PUMPS (M 81-49 THROUGH M 81-52)

LICENSEE SUBMITTAL: SCEW(S): F-2, F-12, F-14, F-19 [33]

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

R, T, Q1, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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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.
- ☐ 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 _____.)
- ☐ 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 |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4A

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

Documented Evidence of Qualification Adequate	_____
Adequate Similarity Between Equipment and Test Specimen Established	<u>X</u> _____
Aging Degradation Evaluated Adequately	_____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u> _____
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	<u>X</u> _____
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	<u>X</u> _____
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NOTES:

The Core Spray Topping Pump Motor requires qualification for pressure (1 psig), radiation ($9.8 \times 10^5 R$) and thermal aging. The licensee has referenced PAR 4021 as documented evidence of qualification.

- This report establishes traceability for the installed motor insulation system to that described in the report (General Electric Custom Polyseal). The report does not however break down the model number so that discrepancies can be resolved (the report discusses 5K8288 40C7 whereas the installed equipment is a 5K8288 37C7).

- The report establishes a radiation threshold level of $2 \times 10^8 R$ (γ) by test of a section of motor insulation although a list of materials and expected radiation threshold values was provided with a limiting case of $5 \times 10^5 R$ for Polyester Resin (unfilled).

Reference 4021 also included radiation damage threshold values for the lead cable insulation and bearing lubricant although it was not established that these items were the same as those in the installed motor.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NOTES:

- The referenced report provided a summary of a Mean Time To Failure analysis performed on failure data obtained on General Electric Industrial Motors shipped from 1961 through 1966 using the least favorable fit to the data. The MTTF was established as 33 years. A 40 year qualified life would still be considered conservative considering the best fit to the data was 174 years.
- The referenced report did not discuss the effects of a 1 psig overpressure on any motors. Engineering judgement shows that this transient will have little effect on typical motors however the licensee should provide documentation that establishes qualification.
- The licensee did not provide a replacement schedule for the bearings and bearing lubricant.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ITEM NO. 43
ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
GENERAL ELECTRIC MODEL 5K6328XC136A
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 43
LICENSEE REFERENCE(S): 3483
FUNCTION (PLANT ID): DRIVES CONTAINMENT SPRAY PUMPS (M 80-03, M 80-04,
M 80-23, M 80-24)
LICENSEE SUBMITTAL: SCEW(S): N-5 THROUGH N-8 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

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.
- ☒ 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
(I.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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43.

NOTES:

The Core Spray and Containment Spray Pump Motors require qualification for pressure (19.5ig), radiation (98EaSR) and thermal aging. The licensee referenced PGR 3483 which is a BWR Equipment Qualification Summary that discusses the following reports;

1. Wyle Laboratories report no. 58455
2. General Electric Co. report no. 491H988

- The licensee did not provide traceability of the installed motors to the motor insulation samples tested.

- The equipment qualification summary lacks the technical information required for an independent reviewer to verify the equipment qualification status. Information such as functional test results, actual test data, anomalies and conclusions was not included.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ITEM NO. 44

ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"

GENERAL ELECTRIC MODEL 5K6366XC166A HC8365174

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 44

LICENSEE REFERENCE(S): 3483

FUNCTION (PLANT ID): DRIVES CORE SPRAY PUMPS (M 81-23, -24, -03, -04)

LICENSEE SUBMITTAL: SCEW(S): F-1, F-11, F-13, F-18 [33]

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

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Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

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.
- ☒ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

The Core Spray and Containment Spray Pump motors require qualification for pressure (1 psig), radiation (9.8 ECR) and thermal aging. The licensee referenced PGR 3483, which is a BWR Equipment Qualification Summary that discusses the following reports;

1. Wyle Laboratories report no. 58455

2. General Electric Co. report no. 491W988

- The licensee did not provide traceability of the installed motors to the motor insulation samples tested.

- The equipment qualification summary lacks the technical information required for an independent reviewer to verify the equipment qualification status. Information such as functional test results, actual test data, anomalies and conclusions was not included.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ITEM NO. 45

POSITION SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"

NAMCO MODEL D2400X

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 45

LICENSEE REFERENCE(S): 21

FUNCTION (PLANT ID): AIR VENT & FILL VALVE POSITION INDICATION (POS 201-08)

LICENSEE SUBMITTAL: SCEW(S): E-2 [33]

FUNCTION (PLANT ID): EQUIPMENT DRAIN SUMP ISOLATION VALVE POSITION INDICATION
(POS 83.1-10)

LICENSEE SUBMITTAL: SCEW(S): D-6 [33]

FUNCTION (PLANT ID): DRYWELL VENTILATION & PURGE VALVE POSITION INDICATION
(POS 201-10)

LICENSEE SUBMITTAL: SCEW(S): D-3 [33]

FUNCTION (PLANT ID): FLOOR DRAIN SUMP ISOLATION VALVE POSITION INDICATION
(POS 83.1-12)

LICENSEE SUBMITTAL: SCEW(S): D-7 [33]

FUNCTION (PLANT ID): NITROGEN MAKEUP & PURGE VALVE POSITION INDICATION (POS
201-16)

LICENSEE SUBMITTAL: SCEW(S): E-7 [33]

FUNCTION (PLANT ID): NITROGEN MAKEUP & VENTILATION VALVE POSITION INDICATION
(POS 201.2-33, -06)

LICENSEE SUBMITTAL: SCEW(S): E-3, E-5 [33]

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 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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



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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	<u>X</u> _____
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	<u>X</u> _____
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

X Qualified [14]

Qualification Assessment On-Going

To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Torus nitrogen makeup & bleed isolation valve position
switch (Pos 201.2-06)

Manufacturer: Namco

Model: D2400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The torus nitrogen makeup and bleed isolation valve is normally closed during plant operation. It is open during inerting or de-inerting operations. The position switch provides valve position indication only and has no control or safety related function. The drywell air vent and purge isolation valve receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures the operator is required to verify isolation and the position switch will most probably indicate properly.

The drywell air vent and purge isolation valve is air operated and fails closed on loss of motive power or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time temperature analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Drywell equipment drain tank outlet isolation valve position switch (Pos 83.1-10)

Manufacturer: Namco

Model: D2400X

Safety Function: Isolation valve position

Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The position switch provides valve position indication only and has no control or safety related function. The drywell equipment drain tank outlet isolation valve (normally open) receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures, the operator is required to verify isolation and the position switch will most probably indicate properly. Backup isolation is provided by motor operated isolation valve 83.1-09 which is to be qualified or replaced with a documented qualified valve operator.

The drywell equipment drain tank outlet isolation valve is air operated and fails closed on loss of motive or control power. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time/temperature aging analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Normal technical specification surveillance with respect to valve exercising provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.

Equipment: Drywell floor drain tank outlet isolation valve position switch (Pos 83.1-12)

Rev. Date: April 2, 1982

[33]

Manufacturer: Namco

Model: D2400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The position switch provides valve position indication only and has no control or safety related function. The drywell floor drain tank outlet isolation valve (normally open) valve receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures the operator is required to verify isolation and the position switch will most probably indicate properly. Backup isolation is provided by motor operated isolation valve 83.1-11 which is to be qualified or replaced with a documented valve operator.

The drywell floor drain tank outlet isolation valve is air operated and fails closed on loss of motive or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time/temperature aging analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Normal technical specification surveillance with respect to valve exercising provides a means to monitor position switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

Equipment: Torus air vent and purge isolation valve position switch (Pos 201-08) Rev. Date: April 2, 1982

[33]

Manufacturer: Namco

Model: 02400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The torus air vent and purge isolation valve is normally closed during plant operation. It is open during inerting or de-inerting operations. The position switch provides valve position indication only and has no control or safety related function. The torus air vent and purge isolation valve receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures the operator is required to verify isolation and the position switch will most probably indicate properly. Back-up isolation is provided by motor operated isolation valve 201-07 which is to be qualified or replaced with a documented valve operator.

The torus air vent and purge isolation valve is air operated and fails closed on loss of motive power or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time temperature analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.

Equipment: Drywell air vent and purge isolation valve position switch (Pos 201-10) Rev. Date: April 2, 1982

[33]

Manufacturer: Namco

Model: 02400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The drywell air vent and purge isolation valve is normally closed during plant operation. It is open during inerting or de-inerting evolutions. The position switch provides valve position indication only and has no control or safety related function. The drywell air vent and purge isolation valve receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures the operator is required to verify isolation and the position switch will most probably indicate properly. Back-up isolation is provided by motor operated isolation valve 201-09 which is to be qualified or replaced with a documented valve operator.

The drywell air vent and purge isolation valve is air operated and fails closed on loss of motive power or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time temperature analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Torus N₂ vent and purge isolation valve position switch
(Pos 201-16)

Manufacturer: Namdar

Model: 02400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The torus N₂ vent and purge isolation valve is normally closed during plant operation. It is open during inerting or de-inerting evolutions. The position switch provides valve position indication only and has no control or safety related function. The torus N₂ vent and purge isolation valve receives an isolation signal within a short time of any event for which it is required to operate. By plant emergency procedures the operator is required to verify isolation and the position switch will most probably indicate properly. Back-up isolation is provided by motor operated isolation valve 201-31 which is to be qualified or replaced with a documented valve operator.

The torus N₂ vent and purge isolation valve is air operated and fails closed on loss of motive power or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Although time temperature analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	POSITION SWITCH	LIMIT SWITCH	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO	
Model Number (5.2.2/-/-)	D2400X	D2400X & SL3	NOTE 2, X
Serial Number	NOT STATED	NOT STATED	
Features/Mounting (5.2.6/-/-)	NOT STATED	NOT STATED	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	16 GA STRANDED WIRE, GE VULCANITE INSULATION	
Location/Elevation	R.B./237'0"	—	
Equipment ID No.	SEE PAGE 12	VARIOUS	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PSR # 21	1961-N007-001 (PSR 21)	NOTE 1
Report Date		11/29/81	
Issued by		NUS CORP.	
Prepared for		FOR NMPC / NMP-1	
Referenced Reports		VARIOUS	NOTE 1
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		ANALYSIS / TEST	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		120V, 45V-A IN-RUSH & 25V-A LOAD	NOTE 2
Operating Conditions (-/2.2.10/2.2.10)		NOT STATED	
Load/Cycles/Voltage/ Current/Freq.			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

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)		LIGHT BULB ILLUMINATION & SOLENOID VALVE OPERATION.	NOTE 2
Accuracy (5.2.5/-/-)		NOT STATED	
Number of Specimens		2	
Test Instruments Calibrated		NOT STATED	
Safety Function (Active/Passive) (-/2.1.3/2.1.3)	PASSIVE	—	
Test Duration (5.2.1/-/-)	—	24 HOURS	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	~ 1 HOUR	—	
Required Function Time	1 HOUR	—	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	COMBINED T/P/H	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
1. Representative Sample			NOTE 4
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)			NOTE 4
Thermal Aging/Basis		ARRHENIUS MODEL	
Material Aging Evaluation (7.0/-/-)		NOT PERFORMED	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		BUNA 'N'	
Radiation Aging, Type		NOT PERFORMED	



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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.4EOG	1.4EOG	NOTE 3
Radiation Aging, Dose Rate	NOT STATED	NOT PERFORMED	
Radiation Aging, Method	ANALYSIS	ANALYSIS	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	BUNA 'N', MELAMINE	
Operational Aging (-/4.2/-)	NOT STATED	NOT STATED	
Other Age Conditioning (-/4.2/-)	NOT STATED	NOT STATED	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12.5 YEARS	12.5 YEARS	NOTE 4
Normal Ambient Temperature	} NOT STATED	—	
Normal Ambient Radiation			
Normal Ambient Humidity			
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/-)			
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB	HELB	
Radiation Type	NOT STATED	NOT PERFORMED	
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.8E05 (AGING + ACCIDENT)	SEE RADIATION AGING	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED ANALYSIS	NOT PERFORMED ANALYSIS	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED		
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	2°F/SEC	NOT STATED	
Peak: °F/psig/RH/Time	126/10/100/10S	340/103/100/3HR.	} NOTE 2
Decrease To: °F/psig/RH/Time	115/1.0/100/2HR	320/75/100/3HR	
Decrease To: °F/psig/RH/Time		250/16/100/18 HR	
Decrease To: °F/psig/RH/Time			
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	NOT STATED		
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A		
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)			
Spray Density (gpm/ft ²)			
Spray Duration			
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. 45

NOTES:

1) PSR #21 consists of an evaluation of the Namco model 22400X and SL3 limit switches for thermal aging, radiation and operation in a harsh environment (HELE or LOCA). PSR #4724 (QSR 014-A-01, 10/16/81), which is a summary report on temperature, pressure and steam exposure tests of two model SL-3400-02 Namco limit switches, is cited as a reference in PSR #21.

The radiation and thermal aging of the switches were evaluated using the results of literature searches for radiation threshold levels and time/temperature characteristics of the materials comprising the switches. An Arrhenius model was used to develop an estimate for the life of the switches in the normal environments and during accident conditions.

It is to be noted that a number of assumptions (11) were made concerning the materials comprising the materials comprising the switch and the materials for which radiation and thermal aging data were available and which formed the basis for the analyses. No justification for the assumptions was included in the report to permit an independent evaluation of the report findings.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

NOTES:

2) PGR # 4724 consists of a combined temperature, pressure and steam exposure test of 2 model SL-3MDP-DT Namco Limit Switches described below:

" Two limit switches were tested in accordance with the test description, entitled "Test Description, Position Switch for Main Steam Isolation Valve, Steam Environment" (attached as Exhibit 1). Briefly, the test consisted of the following. The limit switches test assembly (including the junction box and hookup wire) was placed in a steam chamber. Steam was generated to produce an environment of about 103 psig pressure and 340 F. The switches were operated during a 3 hour period. The environment was then changed to 75 psig pressure and 320 F. The switches were again operated during the next 18 hours. The actions of the limit switches were signified by on and off conditions of the light bulbs and the action of the solenoid valve connected to the limit switches. Upon removal from the test chamber, the test assembly was disassembled and inspected."

The test switches were operated with 120V, 45 V-A inrush and a 25 V-A load from open to closed to open, at the beginning and end of the 24-hour test and at least once for each temperature level time period. This test more than adequately enveloped the expected accident conditions. However, adequate similarity between the test switches and the installed switches has not been shown by the licensee. Therefore, this equipment item has been judged to be deficient with respect to similarity between the test specimens and the installed devices. The licensee did not delineate the similarities and differences between the installed and tested models to permit an independent review for determining the applicability of the test results to the installed equipment item.

3) Section 11.1 (results) of PSR # 21 states the following regarding radiation:



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

NOTES:

Note (3) continued

AS INDICATED IN TABLES II AND III THE
MOST RADIATION SENSITIVE MATERIALS USED IN
BOTH THE D24000 AND SL3 SWITCHES WERE
LIMIT SWITCHES AND BURN-IN AND WELDED CONTACTS
BURN-IN AND WELDED CONTACTS. BURN-IN CAN
WITHSTAND A RADIATION LEVEL OF 1.4×10^6 AND
(REF 7) AND WELDED CONTACTS WITHSTAND A
RADIATION LEVEL OF BETWEEN 10^6 TO 10^7 RADS
(REF 11) IS

THE REFERENCES CITED AS THE SOURCE OF RADIATION DATA FOR THE
MATERIALS WERE NOT MADE AVAILABLE FOR THE REVIEW. HOWEVER, A
REVIEW OF THE EPRI REPORT NP-2129, NOV 1981, DISCLOSED RADIATION
THRESHOLD LEVELS FOR BURN-IN (NITRILE) AND MOLAMINE FORMALDEHYDE OF 2×10^6
AND 6.7×10^6 RADS, RESPECTIVELY. SINCE THE VALUES REPORTED IN PSR #21
WERE FOUND TO BE COMPARABLE TO THOSE GIVEN IN NP-2129 FOR THE MAT-
TERIALS OF CONCERN AND ARE ABOVE THE REQUIRED LEVEL, THIS EQUIP-
MENT ITEM HAS BEEN JUDGED TO BE SATISFACTORY WITH RESPECT TO
RADIATION.

4) Regarding qualified life, PSR #21 makes the following statement:

"BASED ON AN ANALYSIS OF THE MATERIALS USED
IN THE D24000 AND SL3 SWITCHES,
USING THE ASSUMPTION THAT IT WAS BEEN
DETERMINED THAT BURN-IN IS THE MOST
TIME/TEMPERATURE SENSITIVE MATERIAL AT
AMBIENT CONDITIONS THE SWITCHES HAVE A LIFE
OF 18.5 YEARS, AND AT MAXIMUM DESIGN
TEMPERATURE THEIR LIFE IS 63.66 HOURS. IN A
DESIGN BASIS EVENT SHOULD OCCUR DURING THE
18.5 YEAR NORMAL TEMPERATURE LIFE, THE EQUIPMENT
LIFE TO NORMAL LIFE WOULD BE 1.25 DAYS IN
THE ABSENCE OF A REGULAR REPLACEMENT OF
BURN-IN COMPONENTS. THE SWITCHES COULD
BE EXPECTED TO PERFORM THEIR SAFETY RELATED
FUNCTION DURING AN END OF LIFE EVALUATION."



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

" IT IS RECOMMENDED THAT BUNA-N COMPONENTS OF ALL SWITCHES BE REPLACED ON A REGULARLY SCHEDULED BASIS. THE MAXIMUM LIFE OF BUNA-N AT NORMAL SERVICE TEMPERATURES IS CALCULATED TO BE APPROXIMATELY 18.5 YEARS. THESE COMPONENTS SHOULD BE REPLACED APPROXIMATELY EVERY FIVE (5) YEARS TO BE SAFE AND CONSERVATIVE. "



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ITEM NO. 46

POSITION SWITCH LOCATED IN THE STEAM TUNNEL

NAMCO MODEL D2400X

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 46

LICENSEE REFERENCE(S): 21

FUNCTION (PLANT ID): MAIN STEAM BYPASS POSITION INDICATION (POS 01-05, -06)

LICENSEE SUBMITTAL: SCEW(S): B-5, B-7 [33]

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

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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,~~
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Installed TMI Lessons Learned Implementation
Equipment Summary

~~6a, 6b~~

Maintenance and Replacement Schedule Summary

~~7a, 7b, 7c~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

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.
- ☒ 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 (REPLACEMENT IF QUAL CANNOT BE SUBSTANTIATED)
- ☐ 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	II.c Qualified Life Deficiency
<u>I.D</u> Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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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	<u>X</u> _____
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	<u>X</u> _____
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 DETAILED ANALYSIS SEE EQUIPMENT ITEM 45



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

LICENSEE RESPONSE TO NRC SER

- ____ Qualified
- ____ Qualification Assessment On-Going
- X To be Replaced by a Qualified Component [14]

Rev. Date: April 2, 1982 [33]

Nine Mile-Point Unit 1
Component Review Summary Sheet

Equipment: Main steam line outboard isolation valve bypass valve position switch (Pos 01-05 & 01-06)

Manufacturer: Namco

Model: 02400x

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning time/temperature aging

Justification for Continued Operation:

The main steam line outboard isolation valve bypass valves are in the closed position during normal plant operation and are used to warm up the main steam line during reactor startups from a hot condition. The position switch provides valve position indication only and has no control or safety related function. These valves receive an isolation signal within a short time of any event for which they are required to operate. By plant emergency procedures, the operator is required to verify isolation and the position switch will most probably indicate properly. Backup isolation is provided by motor operator main steam line inboard isolation valves which are to be qualified or replaced with documented qualified valve operators.

The main steam line outboard isolation valves bypass valves are air operated and fail closed on loss of motive power or control signal. Once obtaining the closed position, it is unlikely that the valve will change position.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47

POSITION SWITCH LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE,
ELEV. 298'0"

NAMCO MODEL D2400X

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 47

LICENSEE REFERENCE(S): 21

FUNCTION (PLANT ID): NITROGEN MAKEUP AND BLEED ISOLATION VALVE POSITION
INDICATION (POS 201.2-32, -03)

LICENSEE SUBMITTAL: SCEW(S): D-11, D-13 [33]

FUNCTION (PLANT ID): NITROGEN VENTILATION & FILL ISOLATION-VALVE POSITION
INDICATION (POS 201-32)

LICENSEE SUBMITTAL: SCEW(S): D-8 [33]

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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Summary of Licensee Responses to the NRC SER

1b

Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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	II.c Qualified Life Deficiency
<u>I.b</u> Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

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

FOR DETAILED ANALYSIS SEE EQUIPMENT ITEM 45



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4Z

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☐ Qualification Assessment On-Going
- ☒ To be Replaced by a Qualified Component [14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☒ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision 2).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ITEM NO. 48
POSITION SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
MICRO SWITCH MODEL 11LS1
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): 25
FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE POSITION INDICATION (POS 68-08
THROUGH -10)
LICENSEE SUBMITTAL: SCEW(S): E-11 THROUGH E-13 [33]

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, X
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8F

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

Documented Evidence of Qualification Adequate	_____
Adequate Similarity Between Equipment and Test Specimen Established	<u>X</u> _____
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	<u>X</u> _____
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Pressure suppression chamber - reactor building vacuum
breaker position switch (Pos 68-08, 68-09, 68-10)

Manufacturer: Namco

Model: D2400X

Safety Function: Vacuum breaker position indication

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The pressure suppression chamber reactor building vacuum breakers are normally closed during reactor power operations and are provided for vacuum relief between the suppression chamber and atmosphere. The position switch provides valve position indications only and has no control or safety related function. The vacuum breakers are tripped by either of two vacuum switches which sense pressure in the pressure suppression chamber relative to atmosphere. The vacuum breakers are air operated and fail open on loss of motive power or control signals to ensure containment integrity. Backup isolation is provided by a self-actuating check valve.

Although time temperature analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4E

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	POSITION SWITCH	LIMIT SWITCH	
Manufacturer's Name (5.2.2/-/-)	MICRO SWITCH	MICRO SWITCH	
Model Number (5.2.2/-/-)	11LS1	11LS1, LSA2B-1D	NOTE 2, X
Serial Number	NOT STATED	NOT STATED	
Features/Mounting (5.2.6/-/-)	NOT STATED	NOT STATED	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	NOT STATED	
Location/Elevation	R.B./237'0"	—	
Equipment ID No.	POSGR-08;09, -10	POSGR-08,-09,-10	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PSR # 25	1961-M302-001 (PSR # 25)	NOTE 1
Report Date		12/1/81	
Issued by		NUS CORP. FOR	
Prepared for		NMPC/NMP-1	
Referenced Reports		VARIOUS	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST/ANALYSIS	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		NOT STATED	
Operating Conditions (-/2.2.10/2.2.10)		125VDC/125 VAC UN-	NOTE 2
Load/Cycles/Voltage/ Current/Freq.		DER LOAD DURING CYCLING	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

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		1	
Test Instruments Calibrated		NOT STATED	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	PASSIVE		
Test Duration (5.2.1/-/-)	—	N 500 HOURS	NOTE 2
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	N 1 HOUR		
Required Function Time	1 HOUR		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	COMBINED T/H	NOTE 2
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		ARRHENIUS MODEL	
Material Aging Evaluation (7.0/-/-)		NOT PERFORMED	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		BUNA 'N'	
Radiation Aging, Type		NOT PERFORMED	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.4 EOG	1.4 EOG	NOTE 3
Radiation Aging, Dose Rate	NOT STATED	NOT PERFORMED	
Radiation Aging, Method	ANALYSIS	ANALYSIS	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	BUNA 'N'	
Operational Aging (-/4.2/-)	NOT STATED	57,624 OPERATIONAL CYCLES UNDER LOAD	
Other Age Conditioning (-/4.2/-)	NOT STATED	-	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12 YEARS	12 YEARS	NOTE 4
Normal Ambient Temperature Normal Ambient Radiation 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/-)			
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>	:	:	:
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)	HELB	HELB	:
Radiation Type	NOT STATED	NOT PERFORMED	:
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.4 E05	SEE RADIATION AGING	:
Radiation Dose Rate (rd/hr)	NOT STATED	NOT PERFORMED	:
Radiation Qual. Method (5.3.1/-/-)	ANALYSIS	ANALYSIS	:
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED	:	:
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)	:	:	:



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4E

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	1.6 °F/SEC	NOT STATED	
Peak: °F/psig/RH/Time	1. 110/100/105	3 CYCLES AT 257 °F, 95% RH, FOR TOTAL OF 500 HOURS	
Decrease To: °F/psig/RH/Time	115/101 - 1 HR		
Decrease To: °F/psig/RH/Time			
Decrease To: °F/psig/RH/Time			
Equipment Surface Tempera- ture (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)	N/A		
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)			
Spray Density (gpm/ft ²)			
Spray Duration			
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. 46

NOTES:

1) UPSA #2 consists of an evaluation of the Micro Switch model 11LS1 limit switch for radiation and thermal aging and shock environments. The radiation and thermal aging were evaluated using the results of literature searches for radiation threshold levels and time/temperature characteristics for the materials comprising the switch listed on page 5i.

The Arrhenius model was employed to develop the estimate for the device thermal life based on the results of literature search for the device material characteristics.

A number of references were cited in the report which were not made available for the review.

2) A cycling test and a temperature/humidity test was performed on a Micro switch model LSA2B-1 limit switch which was stated to be generically similar to the model 11LS1 switch. No supporting data for this stated similarity was provided in the report. The tests are described as follows:

10A. Cycling

The test specimen was cycled at 125 VDC or 125 VAC supply and under load. The test specimen was tested for a total of 57624 cycles. No damage was observed.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

Note (2) cont'd

103 Harsh Environment

- The test specimen was subjected to three cycles of harsh environment,
- Two at 237°F for 240 hours and one at 237°F for 261 hours. The relative humidity was 95%. The test specimen was operable after the harsh environment tests.

Because the test sample and the equipment item were not shown to be similar in construction, design, and materials, the equipment item has been judged to be deficient with respect to similarity between test sample and installed equipment.

(2) Regarding radiation the report states:

Literature search has revealed that the radiation threshold level is 5×10^6 rads for Viton-A, 1×10^7 rads for Neoprene seal, 1×10^7 rads for Phenolic resin, 1.4×10^6 rads for Buna-N O-ring and 2×10^6 rads for Epoxy resin. No radiation data was obtained for Hydrocarbon Grease.

A review of EPRI report NP-1269 disclosed comparable levels for the materials of concern to those given in PSA #20.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

NOTES:

(4) Regarding thermal aging the report states:

All nonmetallic materials, except Buna-N O-ring, has an expected life exceeding 40 years. Therefore, these materials can be qualified for 40 years of normal service conditions and one design basis event, based on time/temperature effect. Buna-N O-ring has an expected life of 12,009 years using a combination of normal service conditions and a design basis event. Therefore, Buna-N cannot be qualified, based on time/temperature effect.

Recommendations are provided concerning periodic replacement of switch parts (see page 72)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

TABLE 0-1.

Non-metallic Material List and Qualification Data
for Limit Switch 11B1

Component Material	Manufacturer's Rating	Radiation		Time/Temperature		
		Material Analyzed	Radiation Threshold (mrh)	Material Analyzed	Radiation Energy (eV)	Intercept
Seal - Viton A	NA	Viton-A	5×10^6	Viton-A	2799	-12.481
Seal - Neoprene	NA	Neoprene seal	1×10^7	Neoprene Insulation	1.0321	-23.8003
Hydrocarbon grease	NA	NA	NA	NA	NA	NA
Case, cover, carrier - Fire Resistant Phenolic	NA	Phenolic Resin	1×10^8	Durol 125	0.3284	-6.1163
Plugs - Teflon Filled Phenolic	NA	Phenolic Resin	1×10^8	Durol 152	0.6733	-9.9578
Seal - Buna-N	NA	Buna-N	1.4×10^6	Buna-N O-ring	0.75063	-16.2810
Epoxy Bond Adhesive and Grout	NA	Epoxy Resin	2×10^8	Epoxy/Fiberglass VEHIA FR-4, 5-10	1.296	-27.0083

CLIENT: WPA FILE NO: 131-N-402-C01
SUBJECT: Environmental Qualification Analysis BY: John C. Wiles
Checked By: [Signature]

GENUS CORPORATION

Page 1 of 22
DATE: 11/25/61



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

- o *Replace the Buna-N seals every 12 years or less, or*
- o *Replace the Buna-N seal with seal that are qualified for 40 years.*
- o *Lubricants should be replenished regularly.*

Since the calculated life for Buna-N seal is only 12.09 years, the seals should be replaced before failure, that is, 3 - 3 years. Or the seals can be replaced with materials that are qualified for 40 years. Lubricants should be replenished regularly to ensure smooth operations.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ITEM NO. 49
POSITION SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
NAMCO MODEL SL3C58TW
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): MAIN STEAM VALVE POSITION INDICATION (POS 01-01, -02)
LICENSEE SUBMITTAL: SCEW(S): B-20, B-21 [33]

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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	II.c Qualified Life Deficiency
<u>I.b</u> Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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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	<u>X</u> _____
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	<u>X</u> _____
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

LICENSEE RESPONSE TO NRC SER

- ____ Qualified
- ____ Qualification Assessment On-Going
- X To be Replaced by a Qualified Component [14]

Rev. Date: April 2, 1982

[33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Main steam line inboard isolation valve position switch
(Pos 01-01 & Pos 01-02)

Manufacturer: Namco

Model: SL3C-58T-W

Safety Function: Reactor scram on main steam line isolation valve position

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The switch provides a signal to the reactor protection system for reactor scram on main steam line position. There are two independent limit switches per valve and each switch provides an independent signal to the reactor protection system. Failure of the switch to generate a reactor scram on valve position would result in increased reactor pressure and power and a decrease in indicated reactor coolant level, all of which generates reactor scram signals for off normal values of these parameters. Mitigation of a high energy line break or loss of coolant accident is not dependent on these switches. These switches provide an anticipatory reactor trip due to loss of normal heat sink, the main condenser.

Although time/temperature aging analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Normal technical specification surveillance testing provides a means to monitor switch operability for age related failures. Failure due to radiation effects is also unlikely due to the conservative radiation levels specified for qualification purposes. Given the LOCA condition, peak radiation conditions will not have been obtained prior to the main steam isolation valves closures.

Based on the above, continued operation is justified until the switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64P and 8300 B61YP.
- NOTE 2 Qualification assessment ongoing.
- NOTE 3 Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 Further equipment identification needed to assure applicability of test report.
- NOTE 8 The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	POSITION SWITCH	LIMIT SWITCH-	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO	
Model Number (5.2.2/-/-)	SL3C5BTW	D2400X & SL3	
Serial Number	NOT STATED	NOT STATED	
Features/Mounting (5.2.6/-/-)	NOT STATED	NOT STATED	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	16 GA STRANDED WIRE GE VULKENE INSULATION	
Location/Elevation	STEAM TUNNEL 240'0"	—	
Equipment ID No.	PS01-01-02	VARIOUS	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PSR # 21	1961-N007-001 (PSR 21)	NOTE 1
Report Date		11/29/81	
Issued by		NUS CORP. FOR NMPC/NMP-1	
Prepared for			
Referenced Reports		VARIOUS	NOTE 1
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST/ANALYSIS	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		120V, 45 V-A IN-RUSH & 25 V-A LOAD	NOTE 2
Operating Conditions (-/2.2.10/2.2.10)		NOT STATED	
Load/Cycles/Voltage/ Current/Freq.			



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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)		LIGHT BULB ILLUMINA- TION & SOLENOID VALVE OPERATION	NOTE 2
Accuracy (5.2.5/-/-)		NOT STATED	
Number of Specimens		2	
Test Instruments Calibrated		NOT STATED	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	PASSIVE	—	
Test Duration (5.2.1/-/-)	—	24 HOURS	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	1 HOUR	—	
Required Function Time	1 HOUR	—	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	COMBINED T/P/H	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
1. Representative Sample			NOTE 4
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)		ARRHENIUS MODEL	NOTE 4
Thermal Aging/Basis		NOT PERFORMED	
Material Aging Evaluation (7.0/-/-)		BUNA 'N'	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		NOT PERFORMED	
Radiation Aging, Type			



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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.4E06	1.4E06	NOTE 3
Radiation Aging, Dose Rate	NOT STATED	NOT PERFORMED	
Radiation Aging, Method	ANALYSIS	ANALYSIS --	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	BUNA'N', MELAMINE	
Operational Aging (-/-4.2/-)	NOT STATED	NOT STATED	
Other Age Conditioning (-/-4.2/-)	NOT STATED	NOT STATED	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12.5 YEARS	12.5 YEARS	NOTE 4
Normal Ambient Temperature	} NOT STATED	—	
Normal Ambient Radiation			
Normal Ambient Humidity			
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/-)			
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB	HELB	
Radiation Type	NOT STATED	NOT PERFORMED	
Radiation Dose (rd) (4.1.2/1.4/1.4)	5.0E07 (NORMAL + ACCI- DENT)	SEE RADIATION AGING	NOTE 3, X
Radiation Dose Rate (rd/hr)	NOT STATED	NOT PERFORMED	
Radiation Qual. Method (5.3.1/-/-)	ANALYSIS	ANALYSIS	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED		
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	NOT STATED	NOT STATED	
Peak: °F/psig/RH/Time	305/75/100/12 SEC	340/103/100/3 HR	} NOTE 2
Decrease To: °F/psig/RH/Time	300/15/100/12 SEC	320/75/100/3 HR	
Decrease To: °F/psig/RH/Time	200/0/-/12 SEC	250/16/100/18 HR	
Decrease To: °F/psig/RH/Time	150/0/-/2.5 HRS		
Equipment Surface Tempera- ture (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)			
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)			
Spray Density (gpm/ft ²)			
Spray Duration			
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. 49

NOTES:

1) PSR #21 consists of an evaluation of the Namco model D2400X and SL3 limit switches for thermal aging, radiation and operation in a harsh environment (HELB or LOCA). PSR #4724 (QSR 014-A-01, 10/16/81), which is a summary report on temperature, pressure and steam exposure tests of two model SL-3MPP-01 Namco limit switches, is cited as a reference in PSR #21.

The radiation and thermal aging of the switches were evaluated using the results of literature searches for radiation threshold levels and time/temperature characteristics of the materials comprising the switches. An Arrhenius model was used to develop an estimate for the life of the switches in the normal environments and during accident conditions.

It is to be noted that a number of assumptions (11) were made concerning the materials comprising the materials comprising the switch and the materials for which radiation and thermal aging data were available and which formed the basis for the analyses. No justification for the assumptions was included in the report to permit an independent evaluation of the report findings.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NOTES:

2) PGR # 4724 consists of a combined temperature, pressure and steam exposure test of 2 model SL-3MDP-RT Ramco Limit Switches described below:

"Two limit switches were tested in accordance with the test description, entitled "Test Description, Position Switch for Main Steam Isolation Valve, Steam Environment" (attached as Exhibit 1). Briefly, the test consisted of the following. The limit switches test assembly (including the junction box and hookup wire) was placed in a steam chamber. Steam was generated to produce an environment of about 100 psig pressure and 340 F. The switches were operated during a 3 hour period. The environment was then changed to 75 psig pressure and 320 F. The switches were again operated during the next 18 hours. The actions of the limit switches were signified by on and off conditions of the light bulbs and the action of the solenoid valve connected to the limit switches. Upon removal from the test chamber, the test assembly was disassembled and inspected."

The test switches were operated, with 120V, 45 V-A inrush and a 25 V-A load from open to closed to open, at the beginning and end of the 24-hour test and at least once for each temperature level time period. This test more than adequately enveloped the expected accident conditions.

3) Section 4.1 (Results) of ASR #21 states the following regarding radiation:

As indicated in Tables II and III the most radiation sensitive materials used in ASR #21 are 02408X and SL3 switches. Limit switches are Buna-N and Nylon coated Buna-N and Molexine. Buna-N can withstand a radiation level of 1.4×10^6 rads (Ref 7) and Molexine can withstand a radiation level of between 10^6 to 10^7 rads (Ref 11).

The references cited as the source of radiation data for the materials were not made available for the review. However, a review of the EPRI report NP-2129, Nov 1981, disclosed radiation threshold levels for Buna-N (Nitrile) and Molexine formaldehyde of $\sim 2 \times 10^6$



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

NOTE (3) Continued

and 6.7×10^6 rads, respectively. The EPRI values are considered comparable. However, the expected radiation dose of 5.0×10^7 rads is significantly greater than that given in PSE #21 for Buna-N which was identified in the report as the limiting organic material in the switch. Therefore, this equipment item has been judged to be deficient with respect to radiation.

Regarding qualified life, PSE #21 makes the following statement:

"Based on an analysis of the materials used in the D3400 and S13 series switches, using the methods that it has been determined that Buna-N is the most time/temperature sensitive material. At ambient conditions the switches have a life of 10.5 years, and at maximum design temperatures their life is 63.66 hours. If a design basis event should occur during the 10.5 year normal temperature life, the resultant loss to normal life would be 1.20 days. In the absence of a regular replacement of Buna-N components, the switches cannot be expected to perform their safety related function during an end of life loss of life."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

" IT IS RECOMMENDED THAT TYPE SL3 SWITCHES, NUMBERED 01-01 AND 01-02 LOCATED IN REACTOR ISOLATION, EITHER BE REPLACED OR SHIELDED FROM THE SOURCE OF RADIATION. THESE SWITCHES CONTAIN BUNA-N WITH A RADIATION THRESHOLD OF 1.4×10^6 RAD'S AND THE MAXIMUM RADIATION DOSE IN THIS AREA IS 5×10^7 RAD'S. "

" IT IS RECOMMENDED THAT BUNA-N COMPONENTS OF ALL SWITCHES BE REPLACED ON A REGULARLY SCHEDULED BASIS. THE MAXIMUM LIFE OF BUNA-N AT NORMAL SERVICE TEMPERATURES IS CALCULATED TO BE APPROXIMATELY 18.5 YEARS. THESE COMPONENTS SHOULD BE REPLACED APPROXIMATELY EVERY FIVE (5) YEARS TO BE SAFE AND CONSERVATIVE. "



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ITEM NO. 50
POSITION SWITCH LOCATED IN THE EMERGENCY CONDENSER RETURN VALVE CUBICLE,
ELEV. 2 81'0"
NAMCO MODEL SL3L
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE POSITION INDICATION
(POS 39-05, 39-06)
LICENSEE SUBMITTAL: SCEW(S): B-13, B-15 [33]

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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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.
- ☒ 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 (REPLACEMENT IF QUAL. CANNOT BE SUBSTANTIATED)
- ☐ 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)

- | | |
|--|--------------------------------|
| <input checked="" type="radio"/> 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 |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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-0388, 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Emergency condenser condensate return isolation valve
position switch (Pos 39-05, 39-06)

Manufacturer: Namco

Model: 02400X

Safety Function: Isolation valve position indication

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The emergency condenser condensate return isolation valves are normally closed during plant operation and receive a close signal for a steam line break to the affected emergency condenser or an open signal upon system initiation. They are air operated valves which fail open on loss of motive power or control signal. The position switch provides valve position indication only and has no control or safety related function. They receive a signal for valve operation within a short time for any event for which the valves are required to operate. By plant emergency procedures, the operator is required to verify system isolation on system initiation and the position switch will most probably indicate properly. Backup isolation is provided by a self-actuating check valve. Indication of system initiation may be verified by observing other parameters such as reactor pressure and reactor coolant system temperature.

Although time/temperature aging analysis currently indicates limited qualifications based on conservative ambient temperature assumptions, it is unlikely the switch would fail. Valve position is continually displayed in the control room and provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the position switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 _____ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 364P and 8300 361YP.
- NOTE 2 _____ Qualification assessment ongoing.
- NOTE 3 _____ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 _____ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 _____ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X _____ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 _____ Further equipment identification needed to assure applicability of test report.
- NOTE 8 _____ The 510 SS Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	POSITION SWITCH	LIMIT SWITCH	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO	
Model Number (5.2.2/-/-)	SL3L	D2400X & SL3	
Serial Number	NOT STATED	NOT STATED	
Features/Mounting (5.2.6/-/-)	NOT STATED	NOT STATED	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	16 GA STRANDED WIRE, GE VULKENE INSULATION	
Location/Elevation	RA/281'0"	—	
Equipment ID No.	PS 39-05, -06	VARIOUS	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PSR #21	1961-N007-001 (PSR 21)	NOTE 1
Report Date		11/29/81	
Issued by		MUS CORP. FOR	
Prepared for		NMPC/NMP-1	
Referenced Reports		VARIOUS	NOTE 1
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST/ANALYSIS	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		120V, 45V-A IN-RUSH & 25V-A LOAD	NOTE 2
Operating Conditions (-/2.2.10/2.2.10)		NOT STATED	
Load/Cycles/Voltage/ Current/Freq.			



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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)		LIGHT BULB ILLUMINATION & SOLENOID VALVE OPERATION.	NOTE 2
Accuracy (5.2.5/-/-)		NOT STATED	
Number of Specimens		2	
Test Instruments Calibrated		NOT STATED	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	PASSIVE	—	
Test Duration (5.2.1/-/-)	—	24 HOURS	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	~ 1 HOUR	—	
Required Function Time	1 HOUR	—	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	COMBINED T/H/P	NOTE 4
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)		ARRHENIUS MODEL	NOTE 4
Thermal Aging/Basis			
Material Aging Evaluation (7.0/-/-)		NOT PERFORMED	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		BUNA'N'	
Radiation Aging, Type		NOT PERFORMED	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.4E06	1.4E06	NOTE 3
Radiation Aging, Dose Rate:	NOT STATED	NOT PERFORMED	
Radiation Aging, Method	ANALYSIS	ANALYSIS	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	BUNA 'N', MELAMINE	
Operational Aging (-/4.2/-)	NOT STATED	NOT STATED	
Other Age Conditioning (-/4.2/-)	NOT STATED	NOT STATED	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	12.5 YEARS	12.5 YEARS	NOTE 4
Normal Ambient Temperature Normal Ambient Radiation 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/-)			
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB	HELB	
Radiation Type	NOT STATED	NOT PERFORMED	
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.8 E 05 (AGING + ACCIDENT)	SEE RADIATION AGING	
Radiation Dose Rate (rd/hr)	NOT STATED	NOT PERFORMED	
Radiation Qual. Method (5.3.1/-/-)	ANALYSIS	ANALYSIS	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED		
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	NOT STATED	NOT STATED	
Peak: °F/psig/RH/Time	278/7/100/60S	340/100/100/3HR	} NOTE 2
Decrease To: °F/psig/RH/Time	135/0/-/1.5HR	320/75/100/3HR	
Decrease To: °F/psig/RH/Time		250/16/100/18 HOUR	
Decrease To: °F/psig/RH/Time			
Equipment Surface Tempera- ture (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)	N/A		
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)			
Spray Density (gpm/ft ²)			
Spray Duration			
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. 52

NOTES:

1) ASR #21 consists of an evaluation of the Namco model 22400X and SL3 limit switches for thermal aging, radiation and cavitation in a harsh environment (HELB or LOCA). PGR #4724 (QSR 014-A-01, 10/16/81), which is a summary report on temperature, pressure and steam exposure tests of two model SL-3MDC-02 Namco limit switches, is cited as a reference in ASR #21.

The radiation and thermal aging of the switches were evaluated using the results of literature searches for radiation threshold levels and time/temperature characteristics of the materials comprising the switches. An Arrhenius model was used to develop an estimate for the life of the switches in the normal environments and during accident conditions.

It is to be noted that a number of assumptions (11) were made concerning the materials comprising the materials comprising the switch and the materials for which radiation and thermal aging data were available and which formed the basis for the analyses. No justification for the assumptions was included in the report to permit an independent evaluation of the report findings.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NOTES:

2) PSR # 4724 consists of a combined temperature, pressure and steam exposure test of 2 model SL-3MDP-DT Namco limit switches described below:

- 11 Two limit switches were tested in accordance with the test description, entitled "Test Description, Position Switch for Main Steam Isolation Valve, Steam Environment" (attached as Exhibit 1). Briefly, the test consisted of the following. The limit switches test assembly (including the junction box and hookup wire) was placed in a steam chamber. Steam was generated to produce an environment of about 100 psig pressure and 340 F. The switches were operated during a 3 hour period. The environment was then changed to 75 psig pressure and 320 F. The switches were again operated during the next 18 hours. The actions of the limit switches were signified by on and off conditions of the light bulbs and the action of the solenoid valve connected to the limit switches. Upon removal from the test chamber, the test assembly was disassembled and inspected.

the test switches were operated, with 120V, 45 V-A inrush and a 25 V-A load from open to closed to open, at the beginning, and end of the 24-hour test and at least once for each temperature level time period. This test more than adequately enveloped the expected accident conditions.

3) Section 11.1 (Results) of PSR #21 states the following regarding radiation:

- 11 AS INDICATED IN TABLE II AND III THE MOST RADIATION SENSITIVE MATERIALS USED IN BOTH THE DRYBOX AND SUB SEAIRIS WERE LIMIT SWITCHES ARE BUNA-N AND NYLON COVERED BUNA-N AND MELAMINE. BUNA-N CAN WITHSTAND A RADIATION LEVEL OF 1.4×10^6 RADS (REF 7) AND MELAMINE CAN WITHSTAND A RADIATION LEVEL OF BETWEEN 10^6 TO 10^7 RADS (REF 11) 11

the references cited as the source of radiation data for the materials were not made available for the reviewer. However, a review of the EPRI report NP-2129, NOV 1981, disclosed radiation threshold levels for BUNA-N (Nitrile) and Melamine Formaldehyde of $\sim 2 \times 10^6$



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NOTES:

NOTE(3) Continued

and 6.7×10^6 rads, respectively. Since the values reported in PSR #21 were found to be comparable to those given in NP-2129 for the materials of concern and are above the required level, this equipment item has been judged to be satisfactory with respect to radiation.

4) Regarding qualified life, PSR #21 makes the following statement:

"Based on an analysis of the materials used in the D2400 and SLS series switches, using the Arrhenius model it has been determined that BUNA-N is the most time/temperature sensitive material. At ambient conditions the switches have a life of 10.5 years, and at maximum harsh temperatures their life is 6366 hours. In a design basis event should occur during the 10.5 year normal temperature life, the equivalent loss to normal life would be 1.00 days. In the absence of a regular replacement of BUNA-N components, the switches cannot be expected to perform their safety related function during an end of life loss of SLS."



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MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

" IT IS RECOMMENDED THAT BUNA-N COMPONENTS OF ALL SWITCHES BE REPLACED ON A REGULARLY SCHEDULED BASIS. THE MAXIMUM LIFE OF BUNA-N AT NORMAL SERVICE TEMPERATURES IS CALCULATED TO BE APPROXIMATELY 18.5 YEARS. THESE COMPONENTS SHOULD BE REPLACED APPROXIMATELY EVERY FIVE (5) YEARS TO BE SAFE AND CONSERVATIVE. "



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ITEM NO. 51

RADIATION DETECTOR LOCATED IN THE TURBINE BUILDING CONDENSER AREA,
ELEV. 243'0"- 297'0"

GENERAL ELECTRIC MODEL 194X92792

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 51

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MAIN STEAM LINE RADIATION DETECTION (RE RN05A, B, C, D)

LICENSEE SUBMITTAL: SCEW(S): H-17 THROUGH H-20 [33]

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DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:

(See Section 3 of this TER for Legend)

(R), T, (Q1), RT, P, H, CS, (A), S, (R), M, I, (QM), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON - GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going [33];
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ITEM NO. 52

ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT

D.G. O'BRIEN MODEL 19, 5, 28 PIN #16 AND 4 PIN #8

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 52

LICENSEE REFERENCE(S): 17, 1337

FUNCTION (PLANT ID): ELECTRICAL PENETRATION (PLANT I.D. NOT STATED)

SERVICE: ELECTRICAL FEEDTHROUGH

LICENSEE SUBMITTAL: SCEW(S): A-4 [33]

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

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Summary of Licensee Responses to the NRC SER

1b

Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

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 ~~will~~ 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 _____.)
- ☐ 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



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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 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 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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	<i>Electrical Connector</i>	<i>Electrical Connector</i>	
Manufacturer's Name (5.2.2/-/-)	<i>D G O'Brien</i>	<i>D G O'Brien</i>	
Model Number (5.2.2/-/-)	<i>see 5f</i>	<i>see 5f</i>	
Serial Number	<i>N/A</i>	<i>N/A</i>	
Features/Mounting (5.2.6/-/-)	<i>N/A</i>	<i>N/A</i>	
Connections/Interfaces (5.2.6/-/-)	<i>N/A</i>	<i>N/A</i>	
Location/Elevation	<i>Container</i>	<i>N/A</i>	
Equipment ID No.	<i>various</i>	<i>N/A</i>	
<u>QUALIFICATION REPORT</u>			
(8.0/5.0/5.0)			
Report ID Number	<i>FC 4877-1</i>	<i>FC 4877-1</i>	
Report Date	<i>4/78</i>	<i>April 78</i>	
Issued by	<i>FIRL</i>	<i>FIRL</i>	
Prepared for	<i>NMPC</i>	<i>NMPC</i>	
Referenced Reports	<i>N/S</i> <i>1961-0025-001</i>	<i>Test</i>	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)			
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)	<i>NA</i>	<i>Insulation resistance</i>	
Operating Conditions (-/2.2.10/2.2.10)	<i>Various</i>	<i>660 Vac.</i>	
Load/Cycles/Voltage/ Current/Freq.			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

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)	NA	maintain Voltage	
Accuracy (5.2.5/-/-)	↓	N/A	
Number of Specimens	↓	see SF --	
Test Instruments Calibrated	↓	yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Basini	N/A	
Test Duration (5.2.1/-/-)	NA		
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	72 hrs (27h)	105 seconds	
Required Function Time	28 hrs.	NA	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	NA	radiation	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	↓	LOCA	
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)	see note 1	not performed	X
Thermal Aging/Basis	↓	↓	see note 1
Material Aging Evaluation (7.0/-/-)	↓	↓	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	↓	↓	
Radiation Aging, Type	↓	Gamma	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	<i>Not stated</i>	<i>See accident Anal.</i>	
Radiation Aging, Dose Rate	<i>↓</i>	<i>↓</i>	
Radiation Aging, Method	<i>↓</i>	<i>↓</i>	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	<i>↓</i>	<i>↓</i>	
Operational Aging (-/-4.2/-)	<i>↓</i>	<i>↓</i>	
Other Age Conditioning (-/-4.2/-)	<i>↓</i>	<i>↓</i>	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	<i>40 years</i>	<i>not stated</i>	<i>X See note 1</i>
Normal Ambient Temperature	<i>Not stated</i>	<i>N/A</i>	
Normal Ambient Radiation	<i>↓</i>	<i>↓</i>	
Normal Ambient Humidity	<i>↓</i>	<i>↓</i>	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	<i>Spent Mill Program</i>	<i>N/A</i>	
On-Going Analysis of Failures and Degradation (7.0/-/-)	<i>↓</i>	<i>N/A</i>	
Margin (General) (6.0/3.0/3.0)	<i>N/A</i>	<i>Not Stated</i>	
Margin (NUREG-0588, Cat. I) (-/3.2/-)	<i>↓</i>	<i>↓</i>	
1. Temperature (+15°F)	<i>↓</i>	<i>↓</i>	
2. Pressure (+10%, 10 psig max)	<i>↓</i>	<i>↓</i>	
3. Radiation (not required)	<i>↓</i>	<i>↓</i>	
4. Time (+10%, +1 hour + function time minimum)	<i>↓</i>	<i>↓</i>	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	5×10^7	2.6×10^7	X Note 2
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	Not Specified	25 mrd/hr	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		N/A	
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	<i>see</i>		
Peak: °F/psig/RH/Time	<i>Profile</i>	<i>See profile</i>	
Decrease To: °F/psig/RH/Time	<i>P-5 L</i>	<i>P-5 I</i>	<i>the</i>
Decrease To: °F/psig/RH/Time			<i>that</i>
Decrease To: °F/psig/RH/Time			<i>encompasses</i>
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)			<i>the</i>
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)			<i>accident</i>
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	<i>Demer H₂O</i>	<i>None</i>	<i>X Note 3</i>
Spray Density (gpm/ft ²)			
Spray Duration			
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 EQL PMENT ITEM NO. 52

NOTES:

Note 1 - No preaging of the specimens was performed. NUS document 1961-0005-001 [17] several calculations are presented, however documentation references for data were not provided which would permit evaluation by an independent reviewer. However FRC is not aware of any data which would suggest a lifetime of 454.10 years for Vitor A, 325.22 years for Neigocene and 9282.384 years for polyolefin at a temperature of 103°F.

Note 2. the irradiation test does not satisfy the plant requirements. Reference [17] notes that analysis demonstrates that the materials of the connector are satisfactory except for Vitor A and recommends that Vitor A "O" rings be replaced.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NOTES:

Note: The test does not address containment spray nor does the analysis presented in reference [7].
However, Winmill Brest has a semi-enclosed water spray which can be used in the event of an accident.

Conclusion - this equipment is assigned to NRC category 1A because qualification has not been established

Graph of Temperature vs. Time for Run 1000000. The y-axis is Temperature in degrees Fahrenheit (100 to 120). The x-axis is Time in minutes (0 to 100). Two curves are shown: 'OUTER' and 'INNER'. The 'OUTER' curve starts at ~115°F, peaks at ~118°F at 10 minutes, and then decreases to ~105°F at 100 minutes. The 'INNER' curve starts at ~105°F, peaks at ~108°F at 20 minutes, and then decreases to ~100°F at 100 minutes.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ITEM NO. 53
TERMINAL BLOCK LOCATED IN THE CONTAINMENT
GENERAL ELECTRIC MODEL EB5 AND EB25
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 53
LICENSEE REFERENCE(S): 30, 18
FUNCTION (PLANT ID): TERMINAL BOARDS (PLANT I.D. NOT STATED)
LICENSEE SUBMITTAL: SCEW(S): A-5 [33]

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

R, T, Q1, 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 REVIEW OF EQUIPMENT ITEM NO. 53

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.
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a Qualification Not Established</u> | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. C3

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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NRC Contract No. NRC-03-78-118

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

NOTES:

In NUS FILE 1961-6080-001-R1 EPS2187

The review states:



Page 11 of 18

DATE FEB 24 1982

CLIENT NUSC FILE NO. 1961-6080-001-R1 BY R. E. Hill
SUBJECT ENVIRONMENTAL QUALIFICATION OF CREDITED BY J. E. Hill
60 TYPE 85 TERMINAL BLOCKS

12-3 WARM ENVIRONMENT

A GENERAL ELECTRIC TYPE CR-151 TERMINAL BLOCK WAS SUCCESSFULLY TESTED TO A PEAK CONDITION OF 340°F, 103 PSIG, AND 100% HUMIDITY FOR 3 HOURS AS PART OF A 10 DAY TEST. THESE CONDITIONS ARE IN EXCESS OF THE SPECIFIED CONDITIONS FOR A DESIGN BASIS EVENT AT NINE MILE POINT-1. BECAUSE THE CR-151 TERMINAL BLOCK IS MADE OF THE SAME MATERIAL AS THE TYPE EB-5 AND EB-25 TERMINAL BLOCK, THIS TEST QUALIFIES THE BLOCKS IN USE AT NINE MILE POINT-1 FOR WARM ENVIRONMENT.

THE WARM ENVIRONMENT TEST OF A EB-25 TERMINAL BLOCK (REF 136) IS INCONCLUSIVE AS ONE BLOCK IN AN ALUMINUM BOX FAILED, AND ONE IN A STEEL BOX DID NOT FAIL. THE FAILURE MAY HAVE BEEN CAUSED BY THE CHEMICAL REACTION OF BOILED WATER IN CONTACT WITH ALUMINUM. ALSO THE LEVELS OF THIS TEST DID NOT MEET OR EXCEED THE LEVELS SPECIFIED FOR A DESIGN BASIS EVENT AT NINE MILE POINT-1.

REVIEW OF THE PROFILE OF A WARM ENVIRONMENT TEST DONE BY WYLE LABS (FIG. 2) ON A PREVIOUSLY THERMALLY AGED AND IRRADIATED EB-25 TERMINAL BLOCK SHOWS THAT THE BLOCK IS QUALIFIED FOR LEVELS IN EXCESS OF THOSE SPECIFIED FOR A DESIGN BASIS EVENT AT NINE MILE POINT-1. 11

The following comments apply



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

NOTES:

1. The DOR guidelines require that the test specimen and installed equipment be the same.

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).

a statement that the CR151 and EB-5/EB-25 are the same material does not resolve and address the DOR guideline requirements.

2.) Regarding the test profile identified on page 5f, the report referenced states the following:

PAGE NO. 22

REPORT NO. 17436-15

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Test results and analysis show the EB-25 Terminal Blocks to be virtually insensitive to thermal aging. The predicted life of the subject terminal blocks is greater than 10^6 years.

6.2 Per Reference 1, the terminal blocks withstood a total gamma radiation dosage of 2×10^8 rads prior to a successful LOCA Test. The radiation specification calls for 9.4×10^7 rads.

6.3 Per direction by NUSCO, this analysis is limited to thermal and radiation aging effects.

The test profile comes from another



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

NOTES:

report (Wayle 44390-3) which is
not available at FRC to determine
whether the terminal blocks are
qualified.

3 Accordingly, this equipment
is assigned to NRC category IIa
because documented evidence
is not available to establish
qualification and similarity to
the CR151 terminal blocks
was not established

TECHNICAL EVALUATION REPORT

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

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT UNIT 1

VOL. 2 OF 2

NRC DOCKET NO. 50-220

FRC PROJECT C5257

NRC TAC NO. 42476

FRC ASSIGNMENT 13

NRC CONTRACT NO. NRC-03-79-118

FRC TASK -466

Prepared by

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

FRC Group Leader: C. J. Crane

Prepared for

Nuclear Regulatory Commission
Washington, D.C. 20555

Lead NRC Engineer: N. B. Le
P. Shemanski

August 26, 1982

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TECHNICAL EVALUATION REPORT

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NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT UNIT 1

VOL. 2 OF 2

NRC DOCKET NO. 50-220
NRC TAG NO. 42476
NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257
FRC ASSIGNMENT 13
FRC TASK 466

Prepared by

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20th and Race Streets
Philadelphia, PA 19103

FRC Group Leader: C. J. Crane

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Reviewed by:

C. J. Crane
Group Leader

Approved by:

C. J. Crane
Project Manager
D. Harfagane
Department Director



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NRC Contract No. NRC-03-79-118

FRC Project No. C5257

FRC Assignment No. 13

FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54

ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT

RAYCHEM MODEL RG59BU

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 54

LICENSEE REFERENCE(S): 1155

FUNCTION (PLANT ID): INSTRUMENT CONTROL CABLE (PLANT I.D. NOT STATED)

LICENSEE SUBMITTAL: SCEW(S): A-3 [33]

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

R, T, Q1, 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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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~~



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FRC Assignment No. 13
FRC Task No. 446

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

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.
- ☐ 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



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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	_____ <u>X</u> _____
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	_____ <u>X</u> _____
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 page 54.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

NOTES:

The license ACBW sheet identifies the installed cable as

SYSTEM
EQUIPMENT
EVALUATION
WORKSHEET
IEW 77-012
DATA
MANUFACTURER
RAYCHEM
CODE: R09B
MODEL TYPE
RUC 7B/U
FUNCTION
INSTRUMENT CABLE

The test report cited as evidence of qualification is

QUALIFICATION OF RAYCHEM III

CLASS 1E ELECTRIC CABLES



811557

Since there is no presently this cable is assigned to NRC Category IIa



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ITEM NO. 55

ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"

J-M TYPE DUXSEAL

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 55

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FILLER FOR 5KV TERMINAL

LICENSEE SUBMITTAL: SCEW(S): A-17 [33]

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

R, T, QI, 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, ~~4b, 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:

- ☒ 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 (Qualification Assessment On-Going)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ITEM NO. 56
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
BURNDY MODEL GZ
REQUIREL OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): GROUND CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-7 [33]

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
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

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 ---

See page 5 +



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

NOTES:

The review identifies the installed model as Bundy model 672

The test report identifies the test specimens as follows

MATERIALS SUBMITTED:

Uninsulated YAG6 compression terminals, drawing no. SD79849
Uninsulated YAG6DTN compression terminals, drawing no. SD79849
Uninsulated QAG6-B clamp type terminals, drawing no. SA8947

Conductor: 2/0 stranded copper conductor with XHHW insulation rated at 600V.

Tooling: Y35 tool, drawing no. SD32005

Dies: UI6RT dies, index no. 13, drawing no. SD14385

DOR Guidelines require that the test and installed models be the same:

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).

The Reviewer has not established that the model tested is the same as the model installed. Therefore qualification cannot be established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ITEM NO. 57
TERMINAL CONNECTION LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
BURNDY MODEL QAB
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): CABLE TO TERMINAL CONNECTION
LICENSEE SUBMITTAL: SCEW(S): A-11 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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.

☐ 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



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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	<u>X</u> _____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u> _____
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	<u>X</u> _____
III.a	Equipment Exempt From Qualification	_____
III.b	Equipment Not in the Scope of the Qualification Review	_____
IV	Documentation Not Made Available	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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
SUBMITTALQUALIFICATION
DOCUMENTATIONDEFICIENCY
(X OR
NOTE NO.)EQUIPMENT DESCRIPTION

Equipment Type

Manufacturer's Name

(5.2.2/-/-)

Model Number (5.2.2/-/-)

Serial Number

Features/Mounting

(5.2.6/-/-)

Connections/Interfaces

(5.2.6/-/-)

Location/Elevation

Equipment ID No.

QUALIFICATION REPORT

(8.0/5.0/5.0)

Report ID Number

Report Date

Issued by

Prepared for

Referenced Reports

Qualification Method

(5.1, 5.3/2.1, 2.4/2.1, 2.4)

QUALIFICATION TEST PROGRAM

Functional Test Description

(5.2.5/2.2.9/2.2.9)

Operating Conditions

(-/2.2.10/2.2.10)

Load/Cycles/Voltage/

Current/Freq.

Terminal

Terminal -

Connection

Burndy

Burndy

QAB

see page 5 f.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

stem is interfaced.

stem

N/A

N/A

N/A

TD-79601A

TD-79-601A

N/A

11/19/79

N/A

Burndy

N/A

Burndy

N/A

Test

N/A

Continuity and

N/A

Voltage Drop.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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	Maintain Current	
Accuracy (5.2.5/-/-)	N/A	N/A	
Number of Specimens	N/A	6	
Test Instruments Calibrated	N/A	yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	passive	N/A	
Test Duration (5.2.1/-/-)	N/A	110 days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	< 5 hrs	N/A	
Required Function Time	28 hrs	N/A	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)		Thermal Current Aging Vibration Seismic Radiation LOCA.	
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 stated	See page 59	X Note 2
Material Aging Evaluation (7.0/-/-)	↓	Not stated	↓
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	↓	↓	
Radiation Aging, Type			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	<i>Not stated</i>	<i>See Occident Press</i>	
Radiation Aging, Dose Rate	<i>↓</i>	<i>↓</i>	
Radiation Aging, Method			
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	<i>↓</i>	<i>↓</i>	
Operational Aging (-/4.2/-)	<i>↓</i>	<i>↓</i>	
Other Age Conditioning (-/4.2/-)	<i>↓</i>	<i>↓</i>	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	<i>40 years</i>	<i>Not stated</i>	<i>NOTE 2</i>
Normal Ambient Temperature	<i>Not stated</i>	<i>not applicable</i>	
Normal Ambient Radiation	<i>↓</i>	<i>↓</i>	
Normal Ambient Humidity	<i>↓</i>	<i>↓</i>	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	<i>9 Mile Program</i>	<i>↓</i>	
On-Going Analysis of Failures and Degradation (7.0/-/-)	<i>↓</i>	<i>↓</i>	
Margin (General) (6.0/3.0/3.0)	<i>Not stated</i>	<i>↓</i>	
Margin (NUREG-0588, Cat. I) (-/3.2/-)	<i>↓</i>	<i>↓</i>	
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)	<i>↓</i>	<i>↓</i>	
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
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)	MSLB	LOCA	
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	9.8×10^5	22.49×10^7	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	Not stated	6.5×10^5	
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/-/-)			
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. 57

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	<i>Not stated</i>	<i>65°F, 3.1 psi/sec</i>	
Peak: °F/psig/RH/Time	<i>308/123/105</i>	<i>385/66/100/6 hrs</i>	
Decrease To: °F/psig/RH/Time	<i>20/2/9005</i>	<i>320/40/100/3 hrs</i>	
Decrease To: °F/psig/RH/Time		<i>290/52/100/29 hrs</i>	
Decrease To: °F/psig/RH/Time		<i>270/31/100/2 hrs</i>	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)		<i>255/18/100/3 hrs</i>	
		<i>220/6/100/9 days</i>	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	<i>Not stated</i>	<i>220/10/100/95 hrs</i>	
		<i>Not stated</i>	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2:2.8)	<i>Remin H₂O</i>		
Spray Density (gpm/ft ²)	<i>Not stated</i>		
Spray Duration			
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)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

NOTES:

note: The test report state

BURNDY

LABORATORY TEST RECORD No. TD 79-601A

YA, YA-DTM AND QA-8 TYPE UNINSULATED TERMINALS

THERMAL CURRENT AGEING, VIBRATION-SEISMIC, RADIATION AGEING AND LOCA

Test requested by: R. Lal 8 / 2 / 19 78 authorized by: E. S. Ralla
Test completed by: Burndy & Wyle 10 / 1 / 19 78 recorded by: R. G. Ralla
Copy of this record to: R. Lal, E. S. Ralla, M. R. Monahan
First Test Date Sheet: Y1aM, K1aM 12a, 15 Approved by: E. S. Ralla ESR/ROU
Reference: 41-2170

REQUESTING DEPARTMENT: Power Product Development

TEST REQUESTED: Thermal current ageing, vibration seismic ageing, radiation ageing and a LOCA simulation.

PURPOSE OF TEST: To qualify Burndy YA, YA-DTM and QA-8 type terminals to IEEE Standards 323-1974 and 383-1974 for Class 1E equipment for nuclear power generating stations.

CONCLUSIONS: The results of the tests showed the ability of the YA, YA-DTM and QA-8 type terminals to meet the requirements of IEEE Standards 323-1974 and 383-1974.

MATERIALS SUBMITTED:

Uninsulated YA26 compression terminals, drawing no. SD79849
Uninsulated YA26DTM compression terminals, drawing no. SD79849
Uninsulated QA26-8 clamp type terminals, drawing no. SA8947

Conductor: 2/0 stranded copper conductor with XHM insulation rated at 600V.

Tooling: Y35 tool, drawing no. SD32005

Dies: U25AT dies, index no. 13, drawing no. SD14335

The specimens identified the possible unit as QA-8 type



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

NOTES:

*Note 2 - the reviewer has not
provided a basis for the aging which
is:*

2. Thermal Current Aging: The six conductor-terminal assemblies were assembled into a series loop by bolting together the appropriate terminals with steel hardware. Included in the loop was a 5 ft. length of the same conductor from which the loop was assembled, with terminals on each end. This length of conductor served as a control conductor and, after attaching thermocouples to the wire strands at the center of the control, the loop was energized with a current sufficient to obtain a 100°C temperature rise above room ambient on the control conductor. Current was then cycled through the loop as follows:
- 5 cycles, current on 4 1/2 hr., current off 1/2 hr.
 - 10 cycles, current on 2 hr., current off 1/2 hr.
 - 25 cycles, current on 1/2 hr., current off 1/2 hr.

*No qualified life estimate has
been made.*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ITEM NO. 58
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
BURNDY MODEL QA8CB
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): GROUND CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-6 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 158

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.
- ☐ 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



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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 _____
III.b Equipment Not in the Scope of the Qualification Review _____
IV Documentation Not Made Available _____

For detailed evaluation

refer to pages 5a - 5g item 57



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. SE

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ITEM NO. 59
ELECTRICAL CABLE SPLICE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
AMP TYPE PRE INSULATED
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): 20
FUNCTION (PLANT ID): BUTT CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-8 [33]

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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Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 2b, 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

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 _____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [14]
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

NOTES:

1) PSR#20 consists of an evaluation of the termination to determine adequacy of the device to operate during normal and accident conditions. No test data was evaluated nor was there a literature search to obtain information on the device or its constituent materials which would permit a detailed analysis. The report made the following assumptions concerning the device:

8.0 Major Assumptions

8.1 It is assumed that for the purpose of this analysis, the deterioration of metallic components due to time/temperature effects and radiation exposure is insignificant

8.2 It is assumed that if the insulation on the terminal barrels fails, the connectors will be able to perform their function. This assumption is based on the following:

1. Cables are connected, "Metal to Metal", to the terminal blocks.

2. The terminals on the terminal block are separated by barriers from adjacent terminals. This separation will prevent a metal-to-metal short if the insulation on the connector fails.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

NOTES:

Note (1) Continued

The report concludes with the following statement:

"Based on the primarily metallic structure of the AMP connectors degradation due to radiation exposure, time/temperature effects and harsh environment conditions (design basis event) are expected to be minimal during the 40 year life of the plant. Degradation of the insulation on the terminal barrel will not affect the components ability to perform their required functions."

The report has been judged to be completely inadequate and devoid of technical merit. Based on the assumptions the analysis eliminated the major elements of the device as potential problem areas. No justification has been provided for the assumptions nor was there any attempt to substantiate the conclusions, based on the unfounded assumptions, via a literature search.

This equipment item has been judged to be deficient with respect to documented evidence of qualification and it, therefore, is concluded that the qualification of the item has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ITEM NO. 60
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
AMP MODEL RING TONGUE TERMINAL
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): 20
FUNCTION (PLANT ID): CABLE TERMINATION
LICENSEE SUBMITTAL: SCEW(S): A-20 [33]

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,
Nct stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Licensee Response to NRC SER	3a, 2b, 2c, 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:

- ☒ 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)
- ☐ 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 |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

LICENSEE RESPONSE TO NRC SER

X Qualified [14]

 Qualification Assessment On-Going

 To be Replaced by a Qualified Component



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

NOTES:

1) PSR#20 consists of an evaluation of the termination to determine adequacy of the device to operate during normal and accident conditions. No test data was evaluated nor was there a literature search to obtain information on the device or its constituent materials which would permit a detailed analysis. The report made the following assumptions concerning the device:

" 8.0 Major Assumptions

8.1 It is assumed that for the purpose of this analysis, the deterioration of metallic components due to time/temperature effects and radiation exposure is insignificant

8.2 It is assumed that if the insulation on the terminal barrels fails, the connectors will be able to perform their function. This assumption is based on the following:

1. Cables are connected, "Metal to Metal", to the terminal blocks.

2. The terminals on the terminal block are separated by barriers from adjacent terminals. This separation will prevent a metal-to-metal short if the insulation on the connector fails.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

NOTES:

Note (1) Continued

The report concludes with the following statement:

"Based on the primarily metallic structure of the AMP connectors degradation due to radiation exposure, shock/temperature effects and harsh environment conditions (design basis event) are expected to be minimal during the 40 year life of the plant. Degradation of the insulation on the terminal barrel will not affect the component's ability to perform their required functions."

The report has been judged to be completely inadequate and devoid of technical merit. Based on the assumptions the analysis eliminated the major elements of the device as potential problem areas. No justification has been provided for the assumptions nor was there any attempt to substantiate the conclusions, based on the unfounded assumptions, via a literature search.

This equipment item has been judged to be deficient with respect to documented evidence of qualification and it, therefore, is concluded that the qualification of the item has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ITEM NO. 61
TERMINAL LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
OZ GEDNEY MODEL XL
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): 19
FUNCTION (PLANT ID): CABLE CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-9 [33]
FUNCTION (PLANT ID): CABLE CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-1 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

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.

☐ 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



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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	<u>X</u>
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	_____

*The item is a metal terminal
connector and is not susceptible
to damage from the accident exposure.
The piece analysis establishes qualification*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ITEM NO. 62
CIRCUIT BREAKER LOCATED IN THE REACTOR BUILDING
GENERAL ELECTRIC MODEL AKD5
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CIRCUIT BREAKER 600V (16B, 17B)
LICENSEE SUBMITTAL: SCEW(S): L-1, L-2 [33]

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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FRC Task No. 766

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ITEM NO. 63
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
3M/ELECTRO PRODUCTS MODEL NO 83
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-12 [33]

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

R, T, QI, 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

Equipment Item

Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation
Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No.

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~~3a, 3b, 3c, 3d~~

~~4a, 4b, 4c, 4d, 4e, 4f~~

~~5a, 5b, 5c, 5d, 5e, 5f,~~
~~5g, 5h, 5i, 5j~~

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

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.
- ☒ 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 (Qualification Assessment ON-Going)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ITEM NO. 64
ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL NO 227
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): FILLER FOR 5KV TERMINAL
LICENSEE SUBMITTAL: SCEW(S): A [33]

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

R, T, Q1, RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The S10 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ITEM NO. 65
ELECTRICAL CABLE LOCATED IN CONTAINMENT
GENERAL ELECTRIC MODEL VULKENE CABLE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 1135
FUNCTION (PLANT ID): POWER AND CONTROL 600V AND 1000V
LICENSEE SUBMITTAL: SCEW(S): A [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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.

☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

NOTES:

The information contained on the licensee SCEW sheet and in the test report do not provide sufficient information to establish either the cable that was tested or the cable which is installed in the plant. Vulkene is a trade name for a General Electric insulation material. The cable must be identified by either the characteristics required by IEEE-383-74 or by General Electric SI specification number in order to establish qualification. For Convenience, the requirements of the DOR Guidelines and IEEE-383-74 regarding test specimen similarity to installed equipment are reproduced

below.

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 Guidelines

IEEE-383-74

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.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multi-conductor control cable or shielded multi-conductor signal cable (see below for individual components) 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
	vertical flame test singles from cable assembly	2.5.6	1/C - 8, 4 or 2 AWG
	vertical tray flame test	2.5.4	1/C - 16, 14 or 12 AWG
Shielded pairs, triple or quad from multi-conductor 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	
One-wire, 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	1/C - 22 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	
2001-15 000 V power cable 1/C triplexed and multi-conductor	vertical flame test singles from cable assembly	2.5.6	
	vertical tray flame test	2.5.4	8 AWG (2.5kV) 2/C or 1/C or 4/C (2.5kV)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ITEM NO. 66
ELECTRICAL INSULATING VARNISH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL 1309 BLACK INSULATING VARNISH
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEN(S): A-19 [33]

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	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

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.
- ☒ 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 (Qualification Assessment On-Going)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ITEM NO. 67
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL NO 8380
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION INSULATION TAPE
LICENSEE SUBMITTAL: SCEW(S): A-13 [33]

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> X </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6Z

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
- ☒ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ITEM NO. 68
ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE CEMENT
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-14 [33]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[14]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ITEM NO. 69
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE 3/4 INCH FRICTION TAPE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): UNDERCOAT FOR 5KV TERMINAL FILLER
LICENSEE SUBMITTAL: SCEW(S): A-15 [33]

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

R, T, QI, 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 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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
I.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



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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☐ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ITEM NO. 70
5KV TERMINAL INSULATION LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE SPLICING COMPOUND TAPE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-18 [33]

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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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	6a, 6b
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ITEM NO. 71
ELECTRICAL POWER CABLE LOCATED IN THE STEAM TUNNEL
KERITE MODEL QUADRAPLEX ASSEMBLY 5KV
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POWER CABLE
LICENSEE SUBMITTAL: SCEW(S): A-1 [33]

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, n, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
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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



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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

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.

☒ 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 (Qualification Assessment On-going)

☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u> </u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified
- ☐ Qualification Assessment On-Going
- ☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Power Cable

Manufacturer: Kerite

Model: 5kV Quadruplex Cable

Safety Function: Power distribution to engineered safeguard equipment

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The Kerite power cable is used as distribution circuits to motors and transformers. The power conductor insulation is Kerite with a neoprene jacket. The ground conductor insulation is polyvinyl chloride (PVC). The three individually insulated and jacketed power conductors and the insulated ground conductor are cabled together in quadruplex form with no further covering. The cable is installed primarily in conduit. Safety related use of the cable is limited to areas outside the primary containment. Power cable with Kerite insulation have been utilized extensively over the years in various Niagara Mohawk Power Corporation steam generating facilities with no known age related failures. Temperatures would be consistent with those existing within the reactor building. Temperature and pressure conditions resulting from a MELB at cable terminations which are enclosed in junction boxes to ECCS motors are only slightly above normal operating values.

Based on the above, continued operation is justified until the cable is qualified or replaced with qualified cable.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ITEM NO. 72

MOTOR CONTROL CENTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

GENERAL ELECTRIC MODEL IC7700

REQUIRED OPERATING TIME: 28 HOURS

TER CHECKSHEET NO. 72

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ELECTRICAL CONTROL (167, 171B, 161B, 1671)

LICENSEE SUBMITTAL: SCEW(S): L-3, L-4, L-5, L-6 [33]

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 Item

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Summary of Licensee Responses to the NRC SER

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Equipment Environmental Qualification Summary Forms

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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

LICENSEE RESPONSE TO NRC SER

- ☐ Qualified
☒ Qualification Assessment On-Going.
☐ To be Replaced by a Qualified Component

[4]

NOTES USED IN REVISION 4 [33]

- NOTE 1 ☐ Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B61YF.
- NOTE 2 ☒ Qualification assessment ongoing.
- NOTE 3 ☐ Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 ☐ Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 ☐ All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 ☐ Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 ☐ Further equipment identification needed to assure applicability of test report.
- NOTE 8 ☐ The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ITEM NO. 73

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

LIMITORQUE MODEL SMB000, HIBC

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 73

LICENSEE REFERENCE(S): 1063

FUNCTION (PLANT ID): CONTAINMENT SPRAY TO WASTE BUILDING ISOLATION VALVE
(80-115)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-1 [15]

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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

See Page 5f for Evaluation



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM: THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. The Licensee has stated The qualification "assessment ongoing" for this equipment item.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimen in PGR # 1063, the Thermal aging performed does not simulate a 40 year qualified life. The statement made in the "CONCLUSIONS" section of the report,

"... The unit is qualified for a 40 year life as described in the aging criteria."

is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...). Also, only the motor stator was thermally aged and the justification for this selected testing is very weak. No calculations or material analyses were performed in the report.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.a because adequate similarity has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

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 FWR , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.
- X 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.
- X ^{NOT SPECIFICALLY} 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): (THIS SECTION IDENTIFIED BY FRC USING SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16)
 - 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

- ☐ 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ITEM NO. 74

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

LIMITORQUE MODEL SMB000

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 74

LICENSEE REFERENCE(S): 50, 2876

FUNCTION (PLANT ID): CONTAINMENT SPRAY TO WASTE BUILDING ISOLATION VALVE
(80-114)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-2 [15]

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

R, T, QI, 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

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1b

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available:	<u> </u>

See Evaluation on Page 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT ~~IS~~ ^{WAS} APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. The Licensee has stated that the assessment of this equipment item is on-going.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimen in PSR # 50, the Thermal aging performed does not simulate a 40 year qualified life. The statement made in the "CONCLUSIONS" section of the report,

"... The unit is qualified for a 40 year life as described in the aging criteria."

is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...). Also, only the motor stator was thermally aged and the justification for this selected testing is very weak. No calculations or material analyses were performed in the report.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.2 because adequate similarity has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.

X 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.

X The Licensee has ^{NOT SPECIFICALLY} 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): (THIS SECTION IDENTIFIED BY FRC USING SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16)

 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

- 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ITEM NO. 75
MOTORIZED VALVE ACTUATOR LOCATED IN THE DRYWELL, ELEV. 261'0"
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 50, 2876
FUNCTION (PLANT ID): REACTOR COOLANT SAMPLE ISOLATION VALVE (110-127)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-3 [15]

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
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

SEE EVALUATION ON PAGE 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. *The Licensee has stated that the assessment of this equipment item is on-going.*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimen in PSR # 50, the Thermal aging performed does not simulate a 40 year qualified life. The statement made in the "CONCLUSIONS" section of the report,

"... The unit is qualified for a 40 year life as described in the aging criteria."

is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...). Also, only the motor stator was thermally aged and the justification for this selected testing is very weak. No calculations or material analyses were performed in the report.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.2 because adequate similarity has not been established.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.

X 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.

NOT SPECIFICALLY

 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): (THIS SECTION IDENTIFIED BY FRC USING THE SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16.)

X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ITEM NO. 76

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

LIMOTORQUE MODEL SMB000

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 76

LICENSEE REFERENCE(S): 51

FUNCTION (PLANT ID): REACTOR COOLANT SAMPLE ISOLATION VALVE (110-128)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-3 [15]

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

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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

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Maintenance and Replacement Schedule Summary

~~7a, 7b, 7c~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

See Evaluation on Page 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. The Licensee has stated that the assessment of this equipment item is on-going.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. F6

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimen in PSR # 51, the Thermal aging performed does not simulate a 40 year qualified life. The statement made in the "CONCLUSIONS" section of the report,

"... The unit is qualified for a 40 year life as described in the aging criteria."

is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...). Also, only the motor stator was thermally aged and the justification for this selected testing is very weak. No calculations or material analyses were performed in the report.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.2 because adequate similarity has not been established.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.
- X 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.
- X NOT SPECIFICALLY
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): (THIS SECTION IDENTIFIED BY FRC USING SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16.)
- X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ITEM NO. 77

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

LIMITORQUE MODEL SMBO

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 77

LICENSEE REFERENCE(S): 51

FUNCTION (PLANT ID): FLOW CONTROL VALVE FOR TORUS COOLING (80-118)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-4 [15]

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

R, T, QI, 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

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

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) _____
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 Evaluation on Page 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. The Licensee has stated that the assessment of this equipment item is on-going.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

NOTES:

2. The Licensee has not provided any technical basis to support the claim of a 40 year qualified life. Even if the Licensee can establish similarity between the installed equipment and the test specimen in PSR #51, the Thermal aging performed does not simulate a 40 year qualified life. The statement made in the "CONCLUSIONS" section of the report, "... The unit is qualified for a 40 year life as described in the aging criteria."

is unfounded. No basis for the test times or temperatures is provided (i.e. Arrhenius, 10°C Rule...). Also, only the motor stator was thermally aged and the justification for this selected testing is very weak. No calculations or material analyses were performed in the report.

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.a because adequate similarity has not been established.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.
- X 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 Operators' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- X NOT SPECIFICALLY
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): (THIS SECTION IDENTIFIED BY FRC USING SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16.)
 - 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

- ☐ 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ITEM NO. 78

MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

LIMITORQUE MODEL SMB000

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 78

LICENSEE REFERENCE(S): 49

FUNCTION (PLANT ID): EMERGENCY CONDENSER VENT TO TORUS (05-05, 05-07)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-5 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>

See Evaluation on Page 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

"X" DENOTES APPROPRIATE EVALUATION

X THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED DOCUMENT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. (NOTE 1)

— THE LICENSEE HAS NOT PROVIDED DOCUMENTATION FROM THE MANUFACTURER WHICH STATES THAT THE CITED TEST REPORT IS APPLICABLE TO THIS EQUIPMENT ITEM. THE LICENSEE SHOULD IDENTIFY THOSE MOTORIZED VALVE ACTUATORS WHICH INCORPORATE A MOTOR BRAKE. FOR THE MOTORIZED VALVE ACTUATORS AND MOTOR BRAKES (IF APPLICABLE), THE CLASS OF THE INSULATION SYSTEM MUST BE IDENTIFIED. HOWEVER, DUE TO THE RELATIVELY NON-HARSH ENVIRONMENT AT THE INSTALLED LOCATION AND THE EXTENSIVE RADIATION TESTING PERFORMED ON LIMITORQUE MOTORIZED VALVE ACTUATORS, QUALIFICATION CAN BE ESTABLISHED BY EXPERIENCE WITH THE EXCEPTION OF QUALIFIED LIFE.

— THE LICENSEE HAS STATED THAT THIS EQUIPMENT ITEM WILL BE REPLACED WITH A QUALIFIED REPLACEMENT COMPONENT. AN EXACT COMPLETION DATE FOR THIS REPLACEMENT HAS NOT BEEN PROVIDED. THE LICENSEE HAS STATED,

"WORK IS IN PROGRESS TO PURCHASE QUALIFIED REPLACEMENT COMPONENTS. AFTER THEY HAVE BEEN RECEIVED ONSITE, THEY WILL BE INSTALLED AT THE NEXT REFUELING OUTAGE."

THE LICENSEE SHOULD OBTAIN THE APPROPRIATE DOCUMENTATION FROM THE MANUFACTURER WHICH ESTABLISHES TRACABILITY BETWEEN THE INSTALLED AND TESTED EQUIPMENT. THE LICENSEE SHOULD IDENTIFY THE CLASS OF THE INSULATION SYSTEM AND WHETHER OR NOT THE MOTORIZED VALVE ACTUATOR INCORPORATES A MOTOR BRAKE.

1. *The Licensee has stated That The assessment of This equipment item is on-going.*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

NOTES:

2. PSR# 49 was not submitted by The Institute for review. It also appears as though this document is not a valid test report but only a data sheet.

3. No qualified life estimate has been provided

CONCLUSION:

This equipment item is assigned to NRC Qualification Category II.a because documented evidence of qualification is lacking.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7B

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.

X 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.

NOT SPECIFICALLY

X 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): (THIS SECTION IDENTIFIED BY FRC USING THE SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16.)

 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

- 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ITEM NO. 79

SOLENOID VALVE LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

ASCO MODEL HT8317A29

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 79

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POST ACCIDENT SAMPLING BLOCKING VALVE (122-04 THROUGH 122-11)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-6 THROUGH TMI-13 [15]

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

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. Z9

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.
- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):
 - X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ITEM NO. 80
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
ROSEMOUNT MODEL 1152T0280
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): 1764, 1403, 45
FUNCTION (PLANT ID): TORUS WATER LEVEL (58-05, 58-06)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-14, TMI-15 [15]

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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Summary of Licensee Responses to the NRC SER

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Equipment Environmental Qualification Summary Forms

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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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

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

New Item

- ☒ 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 (QUALIFICATION ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <input checked="" type="radio"/> II.a Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

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

*Reference 45 is a seismic Resonant Test procedure
not provided and not applicable. Reference 1764 and
1403 do not apply to the 1152 model with T0280
option*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

LICENSEE RESPONSE TO NRC SER

- ☒ Qualified [4]
☐ Qualification Assessment On-Going
☐ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982 [33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Torus water level transmitters 58-05, 06

Manufacturer: Rosendunt

Model: 1152 T 0280

Safety Function: None

Qualification Discrepancy: Lack of qualification data

Justification for Continued Operation:

The torus water level transmitters provide no control or safety related function. They provide torus water level indication to the operator. Potential failure of these transmitters would not adversely affect accident mitigation.

Based on the above, continued operation is justified.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8303 B61YF.
- NOTE 2 X Qualification assessment ongoing.
- NOTE 3 Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 Further equipment identification needed to assure applicability of test report.
- NOTE 8 The 510 DU Trip/Calibration system is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.
- X 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
 - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position
 - X II.F.I accident - Monitoring / tower water level



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ITEM NO. 81

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0" (TMI ACTION PLAN ITEM II.F.2)

ROSEMOUNT MODEL 1153CA9

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 81

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT PRESSURE (36-23A, 36-23B)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-16, TMI-17 [15]

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

R, T, QI, 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 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

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

New item

- ☐ 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)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. PI

LICENSEE RESPONSE TO NRC SER

Note 1: Assessments Ongoing.

[15] --



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcoox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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 REQ evaluation.
- The Licensee has provided a standard Owners position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- X 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
 - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

- 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ITEM NO. 82

PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

ROSEMOUNT MODEL 1153 SERIES A

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 82

LICENSEE REFERENCE(S): 45, 1403, 1764

FUNCTION (PLANT ID): CONTAINMENT PRESSURE INDICATION (201.2-483, 201.2-484)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-18, TMI-19 [15]

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 REVIEW OF EQUIPMENT ITEM NO. 82

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

New item

- ☐ 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 (Qualification Assessment On-going)

☐ 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



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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 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 _____

See Page 5j



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER

☐ Qualified

☒ Qualification Assessment On-Going

☐ To be Replaced by a Qualified Component



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I X; NUREG-0588, Cat. II assumed, no punch data provided.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	<i>Differential pressure Transmitter</i>	DIFFERENTIAL PRESSURE TRANSMITTER	
Manufacturer's Name (5.2.2/-/-)	<i>Rosemount</i>	ROSEMOUNT	
Model Number (5.2.2/-/-)	<i>1153</i>	1153 DAS	<i>see note 1 and note 4</i>
Serial Number	<i>SERIES-A NA</i>	106186 THRU 106188	
Features/Mounting (5.2.6/-/-)	<i>Not stated</i>	1153 SERIES A	
Connections/Interfaces (5.2.6/-/-)	<i>not stated</i>	ROSEMOUNT MOUNTING BRACKET LOW SIDE PLUMBED TO ATMOSPHERIC	
Location/Elevation	<i>see page 1a</i>		
Equipment ID No.	<i>see page 1a</i>	N/A	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	<i>Rosemount 3788</i>	RMT 3788	[1764]
Report Date	<i>NA</i>	March 23, 1978	
Issued by	<i>NA</i>	Rosemount	
Prepared for		Rosemount	
Referenced Reports	<i>—</i>	RMT 37821	[4423]
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	<i>Test</i>	TYPE TEST	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)	<i>NA</i>	UNIT POWERED AND PRESSURIZED	
Operating Conditions (-/-2.2.10/2.2.10)	<i>NA</i>	0 - 750" H ₂ O Range	
Load/Cycles/Voltage/ Current/Freq.		4 - 20 ma.	



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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)	NA	$\pm 5\%$ G.O.S. MPAD, 40 MPAD $\pm 8\%$ DURING STM TEST	
Accuracy (5.2.5/-/-)	not stated	MAX. OUTPUT SIGNAL DEVIATION $+3.7\%$ OF SPAN DURING RADIATION $+6.95\%$ STEAM	NOTE 2
Number of Specimens	NA	3	
Test Instruments Calibrated	NA	YES / NBS	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	active	N/A	
Test Duration (5.2.1/-/-)	NA	64 hr 20 min	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	91 min.	N/A	
Required Function Time	100 days	N/A	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	NA	RADIATION / SEISMIC / STEAM - PRESSURE / SPRAY	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	NA	N/A	
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging		N/A	
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)	not stated	NONE	X - see Conclusion Page 5a
Thermal Aging/Basis			
Material Aging Evaluation (7.0/-/-)	not stated	NONE	X
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	not stated	NONE	X
Radiation Aging, Type		GAMMA Co ⁶⁰	



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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	
Radiation Aging, Dose Rate		SEE ACCIDENT DOSE	
Radiation Aging, Method		TEST	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		NO	
Operational Aging (-/4.2/-)	NA	N/A	
Other Age Conditioning (-/4.2/-)	NA	N/A	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	Not stated	NOT STATED	X - see Conclusion Page 5a
Normal Ambient Temperature		N/A	
Normal Ambient Radiation			
Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)		NOT STATED	
On-Going Analysis of Failures and Degradation (7.0/-/-)		NOT STATED	
Margin (General) (6.0/3.0/3.0)	NA	10% on RADIATION	
Margin (NUREG-0588, Cat. I) (-/3.2/-)	NA	N/A	
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.37 1.1, 1.2; 1.5/1.1, 1.2, 1.5)	HELB/	N/A	
Radiation Type	GAMMA	GAMMA C ⁶⁰	
Radiation Dose (rd) (4.1.2/1.4/1.4)	not stated	44 X 10 ⁶ RAD	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	not stated	0.5 X 10 ⁶ R/HR TEST	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NA	N/A	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	NA	N/A	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	2 X 10 ⁶ R	44 X 10 ⁶ RAD	
Plateout Dose Considered (-/1.48/1.48)	NA	N/A	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	NA	N/A	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. P2

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase		1.5 % / 0.67 psig/s	
Peak: °F/psig/RH/Time	212/1 / 100/1 hr	* 350/120/100/0-10M	* 2 CYCLES in 3 hour INTERVAL
Decrease To: °F/psig/RH/Time	170/1 / 100/1 hr	303/55/100/8 hr	
Decrease To: °F/psig/RH/Time		250/15/100/56 hr	
Decrease To: °F/psig/RH/Time		ROOM TEMP.	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	NA	NONE	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	NA	TEST	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	NA	H3 30. 15000 PPM NAOH PH 10.5 @ 77°F	
Spray Density (gpm/ft ²)	NA	0.15 gpm/ft ²	
Spray Duration	NA	10 - 24 hours	see note 3
Submergence Duration (4.1.3/2.2.5/2.2.5)	NA	NONE	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	NA	NO LEAKAGE DETECTED	
Time to Submergence	NA	N/A	
Dust Environment (-/2.2.11/2.2.11)	NA	N/A	



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NOTES:

Note 1. The test report stated the following:

These test units are representative of the whole 1153 Series A model line. The remainder of the model line differ by the spring constant (thickness) of the sensing diaphragm and by the process pressure level. The stiffness of the metal sensing diaphragm, whose movement is minute - .004 inches, does not constitute a significant design difference. Radiation, vibration, and steam temperatures would not effect diaphragm stiffness to the extent that performance would exceed the specified acceptance criteria limits. Also, all transmitters within the model line have a design capability of withstanding a process pressure proof load of 10,000 psi. This is more than twice the maximum operating pressure range of any transmitter. Hence, process pressure is a static load which is well below the design proof load and the effects of this static loading would not be significantly enhanced by exposure to the qualification testing.

Thus, the entire 1153 Series A model line is qualified to the acceptance levels specified in this document by virtue of similarity to the test units.

Model No.	Type	Span		Maximum Working or Maximum Static
		Min.	Max.	
1153DA3	Differential	0-5" H ₂ O	0-30" H ₂ O	2000 psig
1153DA4	"	0-25" H ₂ O	0-150" H ₂ O	"
1153DA5	"	0-125" H ₂ O	0-750" H ₂ O	"
1153DA6	"	0-17 psid	0-100 psid	"
1153DA7	"	0-50 psid	0-300 psid	"
<u>1153DA8</u>	"	0-170 psid	0-1000 psid	"



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

NOTES:

1153HA4	Differential	0-25" H ₂ O	0-150" H ₂ O	4500 psig
1153HA5	"	0-125" H ₂ O	0-750" H ₂ O	"
1153HA6	"	0-17 psid	0-100 psid	"
1153HA7	"	0-50 psid	0-300 psid	"
1153AA5	Absolute	0-10" HgA	0-55" HgA	2000 psig
1153AA6	"	0-17 psiA	0-100 psiA	"
1153AA7	"	0-50 psiA	0-300 psiA	"
1153AA8	"	0-170 psiA	0-1000 psiA	"
1153AA9	"	0-500 psiA	0-3000 psiA	4500 psig
11536A3	Gauge	0-5" H ₂ O	0-30" H ₂ O	2000 psig
1153GA4	"	0-25" H ₂ O	0-150" H ₂ O	"
1153GA5	"	0-125" H ₂ O	0-750" H ₂ O	"
1153GA6	"	0-17 psig	0-100 psig	"
1153GA7	"	0-50 psig	0-300 psig	"
1153GA8	"	0-170 psig	0-1000 psig	"
1153GA9	"	0-500 psig	0-3000 psig	4500 psig

Note 2 - The report states:

Summary of Radiation Results

During the exposure period, the following worst case output signal deviations were noted: -.6%, +3.7%, and +1.5% of span for serial numbers 106186, 106187, and 106188; respectively. These results are well within the expected error band of $\pm 5\%$ upper range limit. The post-test calibration check indicates that all transmitters returned to near normal performance; all transmitters were within 0.5% of the pre-test data. No changes worthy of noting were seen in liftoff voltage or time constant parameters in the before to after comparison. The temperature coefficient data do indicate that radiation does have an effect on this parameter; however, the magnitude of this effect is small. The largest difference between the pre-to-post test data at the hot temperature (200°F) was only 1.3% of span.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 02

NOTES: Note 3 - the report stated:

The deviation from procedure resulted from a problem with the filtration system for the chemical spray. The plumbing for the spray became clogged such that units 106186, 106187, and 106188 were sprayed for 10, 21, and 24 hours; respectively. The procedure originally specified 24 hours of chemical spray. This deviation does not impact the results of the test for three reasons. First, the transmitter design is one in which all exposed surfaces are of ferrous material and are chemically compactable with the spray. Second, the strip chart data for signal output and past development testing indicate that the output signal is unaffected by the spray introduced into the chamber. Third, unit 106188 did experience the required amount of spray and, therefore, demonstrates the design compactability with the 24 hours of spray.

It is concluded from the results present that all three units met the requirements of the steam/chemical test.

Note 4 - the report stated:

CONCLUSIONS

It is concluded from the data obtained from this type-test program, a summary of which is document in this report, that all three test units have successfully demonstrated the Rosemount Model 1153 Series A pressure transmitter to be qualified for Class 1E service in those applications requiring compliance with the 1971 IEEE standards.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NOTES:

CONCLUSION BASED ON REVIEW OF REPORT [1764]

Three differential range 1153DA3 transmitters were sequentially tested. These units are representative of the entire 1153 Series A model line. The remainder of the model line differs by the sensing diaphragm, spring thickness, and the process pressure rating. These differences are not significant with respect to qualification testing. Thus, the following model line is qualified by virtue of similarity:

1153DA3 through 8
1153HA4 through 7
1153AA5 through 9
1154GA3 through 9

The transmitters were exposed to a radiation exposure rate of 0.5 Mrd per hour for a total integrated dose of 44 Mrd. The maximum output signal deviation noted was +3.7% of span.

The three transmitters were LOCA tested in a steam temperature/pressure/chemical-spray environment for 64 hours. The maximum error exhibited was +6.95% of span.

all units successfully passed test in accordance with acceptance criteria. Testing was under IEEE-323(71) standard. Qualification program satisfies all applicable criteria of the DOR Guidelines except that aging degradation and qualified life or replacement schedule has not been addressed.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

NOTES:

Based on knowledge gained through review of qualification information associated with the small program, we note the following information reported:

Qualification testing of Rosemount Model 1153, Series A, per Rosemount Report No. 3788 states that the transmitter is qualified per the requirements of IEEE 323-1971. Missing from this report is the aging parameter not required for IEEE 323-1971 but necessary for complete LOCA qualification. Recent Rosemount testing to qualify a transmitter to meet IEEE 323-1974 requirements has resulted in failure. A combination of thermal aging, irradiation and chemical spray test specification parameters has resulted in failed components. The initial failed element was an O-ring comprised of sulphur cured polyethylene rubber. This allowed steam/chemical spray to affect electronic components. The O-ring mode of failure is attributed to high temperature vs. time necessary for the Arrhenius curve time compression to satisfy aging test requirements.

The Licensee is encouraged to contact Rosemount for information regarding the reported failure. The NRC shall investigate the reported failure also to determine cause.

Based on the above, this equipment item is placed in NRC Category IIa. It is noted in the BWR's, this equipment item is required for long term post-accident monitoring after a LOCA



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.
- X 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

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

X II.F.1 Accident Monitoring/Containment Pressure



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ITEM NO. 83
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0" (TMI ACTION
PLAN ITEM II.F.2)
ROSEMOUNT MODEL 1153DA5
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT LEVEL (36-24A, B)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-20, TMI-21 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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

New item

- ☐ 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 _____.)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

LICENSEE RESPONSE TO NRC SER

Note 1: Assessment Ongoing

[15]



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. P3

- ☐ 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ITEM NO. 84

FLOW SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0" (TMI ACTION
PLAN ITEM II.F.1)

FOXBORO MODEL E13DL TRANSMITTER

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 84

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FLOW CONTROL (FET 664)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-22 [15]

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, RFN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

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

New item

- ☐ 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 _____.)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

LICENSEE RESPONSE TO NRC SER

Note 1: Assessment Ongoing

[15] --



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

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 , BWR .

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , 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.
- X 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

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

 X II.F.1 *Post-accident Monitoring / Sampling*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ITEM NO. 85

PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"

STATIC-O-RING MODEL 5NNKK351C1A

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 85

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POST ACCIDENT SAMPLING PUMP BYPASS (122-14)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-23 [15]

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

B, 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

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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, ~~X~~

Maintenance and Replacement Schedule Summary

~~7a, 7b, 7c~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):

X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ITEM NO. 86

RADIATION DETECTOR LOCATED IN THE REACTOR BUILDING, ELEV. 261'0"

GENERAL ATOMIC MODEL RD23

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 86

LICENSEE REFERENCE(S): 2840

FUNCTION (PLANT ID): RADIATION DETECTION (201.7-36A, 201.7-37A)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-24, TMI-25 [15]

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

R, T, Q1, 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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

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

new item

- ☐ 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 _____.)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

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 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
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; 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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	RADIATION DETECTOR	High Range Radiation Monitor	
Manufacturer's Name (5.2.2/-/-)	GENERAL ATOMIC	General Atomic	
Model Number (5.2.2/-/-)		RD-23	
Serial Number		Y-501; Y-1894A	
Features/Mounting (5.2.6/-/-)		Reuter Stokes RS-C3-1006-201	
Connections/Interfaces (5.2.6/-/-)	NOT Stated	Detector assembly	
Location/Elevation	Rx BLDG.	Rockbeston coax Raychem WCSF (splice sleeves)	NOTE 1 X
Equipment ID No.	FLOOR AREA 261'		
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	E-254-960	E-254-960	
Report Date		December 15, 1980	
Issued by	General Atomic	General Atomic	
Prepared for		General Atomic	
Referenced Reports			
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)			
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)		Leakage current check	
Operating Conditions (-/2.2.10/2.2.10)			
Load/Cycles/Voltage/ Current/Freq.			



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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)	:	:	:
Accuracy (5.2.5/-/-)	:	:	:
Number of Specimens	:	2	:
Test Instruments Calibrated	:	:	:
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Cont. H _i Range Radiation Monitor	:	:
Test Duration (5.2.1/-/-)	:	~18 days	:
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	1 HR	:	:
Required Function Time	100 days	:	:
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	:	LOCA/SEIS	:
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)	:	NOT PERFORMED	X
Thermal Aging/Basis	:	:	:
Material Aging Evaluation (7.0/-/-)	:	GENERAL ATOMIC E-115-699	:
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	:	:	:
Radiation Aging, Type	:	:	:



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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)	NOT STATED	NOT PERFORMED	X
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/-)	40yr.	3 days, 3 cycle 60°C, 80-90% rh	X
Normal Ambient Temperature	NOT STATED		
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; analysis of induced gamma heating	
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)			



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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.)
<u>ACCIDENT CONDITIONS</u>			
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)	HELB		
Radiation Type	2.0×10^6 rd.	NOT PERFORMED	X
Radiation Dose (rd) (4.1.2/1.4/1.4)			
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/-/-)	2.0×10^6 rd.	NOT PERFORMED	X
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)			



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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.

X 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.

X The Licensee ^{NOT SPECIFICALLY} 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): (THIS SECTION IDENTIFIED BY FRC USING SYSTEM NAME, FUNCTION, SERVICE AND REFERENCE PSR #16)

 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

- 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
- X 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 (BWR/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/7-1-81) 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)



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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.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	-	7°F, 1.5 psi/sec.	
Peak: °F/psig/RH/Time	205/1/-/20sec	400/57/100/10 min.	
Decrease To: °F/psig/RH/Time	190/1/-/1 min.	400-175/57 to 0/100/10 min. to 2.4 HR	
Decrease To: °F/psig/RH/Time	160/1/-/100 min.	175-411/0 to 53/100/8 sec.	
Decrease To: °F/psig/RH/Time		390/57/100/10 min.	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)		330/57/100/10-30 min. 305/57/100/30 min. 260/40/100/3 hr. 205/46/100/4 days	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)		150/4.5-10/100/14 days	
		TEST	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	NA	0.28 m H ₃ BO ₃ 0.064 m Na ₂ S ₂ O ₃	
Spray Density (gpm/ft ²)	NA	0.15 gpm/ft ²	
Spray Duration	NA	continuous after 10 min.	
Submergence Duration (4.1.3/2.2.5/2.2.5)	-		
In-Leakage Considered (5.2.6, 5.3.2/-/-)	-	NA	
Time to Submergence	-	NA	
Dust Environment (-/2.2.11/2.2.11)	-	NA	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

NOTES:

1. The licensee has presented test information which shows that the RD-23 detector is qualified for the Three Mile Point environmental parameters. The testing revealed deficiencies with the original cable and connections interfacing the detector. These original cable and connection interface may be identical to that installed at Monticello. It should be noted that the testing program identified several modifications of the interface were made in order to obtain a satisfactory connector. The coaxial cable has not been qualified, the test report stated [2848]:

"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.

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 and 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.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

NOTES:

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 13-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. //

Based on these statements, the following deficiencies are noted:

- 1.) Adequate similarity between the presently installed interface and the interface that successfully passed testing has not been established.
- 2.) The entire detector assembly including interfacel (cable, connector, splices, etc.) have not been analyzed or tested for radiation effects.
- 3.) Although a satisfactory aging analysis was performed on the detector, no similar analysis was performed on the connecting interface.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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
 - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position
 - X II.F.1 High Range Radiation Monitor



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ITEM NO. 87

LIMIT SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

MICRO SWITCH MODEL F

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 87

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (122-04 THROUGH 122-11)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-26 THROUGH TMI-33 [15]

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

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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

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Maintenance and Replacement Schedule Summary

~~7a, 7b, 7c~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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.
- ☒ 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. (ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.n	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):

X 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



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FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ITEM NO. 88
THERMOCOUPLE LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
OMEGA MODEL HWANSA22312DH114T834
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (TE-7C-269A, -TE-70-276A)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-34, TMI-25 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):
 - X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ITEM NO. 89

THERMOCOUPLE LOCATED IN THE CONTAINMENT

PYCO MODEL 0231710820395

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 89

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (36-29A, B)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-36, TMI-37 [15]

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

R, T, QI, 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~~



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FRC Task No. 766

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

- ☐ 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ITEM NO. 90
THERMOCOUPLE LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
PYCO MODEL 0231710820395
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (36-29C, D)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-37, TMI-38 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

- 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 (BWR/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/7-1-81) 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)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ITEM NO. 91
ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
FRANKLIN MOTOR/BURKS PUMPS MODEL 3CT5MJ
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 91
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PUMP MOTOR (122-01, -02)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-39, TMI-40 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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, X
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life	<u> </u>
	or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

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 , BWR X.
The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):
 - X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ITEM NO. 92
ELECTRICAL CONNECTOR LOCATED IN THE REACTOR BUILDING, ELEV. 306'0"
D.G. O'BRIEN MODELS C10C0001G14, C10C1001G21
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 92
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-41 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

SUMMARY OF LICENSEE RESPONSES TO TPF 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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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 | II.c Qualified Life Deficiency |
| I.b Modification | III.a Exempt |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope |
| II.b Not Qualified | IV Documentation Not Available |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:

X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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

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

X II.F.1 CONTAINMENT HIGH RANGE MONITOR



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ITEM NO. 93
ELECTRICAL CONNECTOR LOCATED IN THE REACTOR BUILDING, ELF7. 261'0"
D.G. O'BRIEN MODELS C10C0001G14, C10C1001G21
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 93
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-42 [15]

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

R, T, Q, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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.

☒ 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 (ASSESSMENT ON-GOING)

☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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

X II.F.1 Containment High range monitor



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ITEM NO. 94

ELECTRICAL CABLE, COAXIAL LOCATED IN THE REACTOR BUILDING, VARIOUS ELEVATIONS
ROCKBESTOS MODEL RSS6104

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 94

LICENSEE REFERENCE(S): 47, 8

FUNCTION (PLANT ID): RADIATION MONITOR SIGNALS

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-43 [15]

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

R, T, Q, 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~~



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

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.
- ☐ 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



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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 _____
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

See pages 54 and 59



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

NOTES:

Although the licensee has not provided the referenced report
The Licensee has cited Rockbestos report dated 1/18/81

as evidence of qualification for Rockbestos RSS-6-104 coaxial cable

From information available to FRC from all sources evaluated during the
review of environmental qualification of Electrical equipment it should
be noted that the RSS-6-104 cable was used by General Atomics Corp. as
signal cable for the high range radiation monitoring equipment developed
to meet TMI action plan requirements. The Cable evidenced severe anomalies
during the qualification testing of the GAC system. Other Licensees
using the cable have reported the following:

u

Equipment Item No. 91 (TMI Action Plan Item)
Electrical Cable Located in the Drywell
Rockbestos Model RSS-6-104
Electrical Cable for Radiation Monitor
Licensee Reference 3247
Required Operating Time: Continuous
TER Checksheet No. 91
Licensee Submittal: Page IV-27 [22]

1. This new cable was installed during the 1980 refueling
outage as part of New High Rad Detectors.
2. The Coax Connectors (P/N N-44079-02) and Raychem WCSF-N
Tubing are qualified under the Conax IPS Reports.
3. Vendor has advised of an anomaly in temperature qualification
which may affect this equipment. An investigation is present;
in progress to determine applicability and effect on this.

Replace cable with a qualified equivalent. Replacement to be supplied by
General Atomic and the Rockbestos Company as soon as it (cable) is available.

The manufacturer has also advised that the problems have been associated
with the difficulties of providing good signal transmissibility together
with high temperature capability (cross linking). The licensee needs to
determine from the manufacturer whether the cable installed is suitable for
the application. If used in the GAC high range monitor the cable is not
qualified.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

NOTES:

This Equipment, however is assigned to NRC category IV because the
documentaion has not been provided and FRC is not aware of a Rockbestos test
report for COaxial cable having a date of 1/18/81.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ITEM NO. 95
ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE REACTOR BUILDING, VARIOUS
ELEVATIONS
ROCKBESTOS MODEL TSP16
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 95
LICENSEE REFERENCE(S): 1391
FUNCTION (PLANT ID): RELATED INSTRUMENTATION MODIFICATIONS
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-44 [15]

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

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

New item

- ☐ 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 _____.)
- ☐ 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

I.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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

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
III.a Equipment Satisfies All Requirements Except Qualified Life
 or Replacement Schedule Justified
III.b Equipment Exempt From Qualification
III.c Equipment Not in the Scope of the Qualification Review
IV Documentation Not Made Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

NOTES:

The licensee has provided the following information concerning installed and tested Cable.

the SCEW Sheet states

the referenced test report states

System
Component
Evaluation
Worksheet
I&E B. 79-01B

Data

Manufacturer:

Rockbestos

Model or type

TSP #16

Function:
Related Instru-
mentation Mod-
ifications

TEST SAMPLE DESCRIPTIONS

Instrumentation Cable

Single Conductor #16 AWG, 300 volt., 20 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

*Control Cable

Single Conductor #12 AWG, 600 volt, 30 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

Power Cable

Single Conductor #6 AWG, 600 volt, 45 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

* Also qualifies Firewall SIS (NEC Type SIS).

C13917

The licensee has not provided information which establishes that the installed and tested equipment is the same.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

NOTES:

The requirements of DOR Guidelines and IEEE-383-74 are reproduced below.

DOR Guidelines

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).

IEEE-383-74

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.

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 components) 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
	vertical flame test singles from cable assembly	2.5.6	1/C - 6, 4 or 2 AWG
	vertical tray flame test	2.5.4	1/C - 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded
	thermal and radiation exposure	2.3.3	16 AWG or actual cable
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
	vertical tray flame test	2.5.4	
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	
	vertical tray flame test	2.5.4	
Six, or pair thermocouple extension cable	temperature and moisture resistance	2.3.1	1/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 (17 kV) 2/C or 4/C or 4/C (2-17 kV)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ITEM NO. 96
ELECTRICAL CONTROL CABLE LOCATED IN THE REACTOR BUILDING, VARIOUS ELEVATIONS
ROCKBESTOS, MODEL NOT STATED
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 96
LICENSEE REFERENCE(S): 1391
FUNCTION (PLANT ID): CONTROL CABLE
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-45, TMI-46 [15]

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:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 812

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.
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a Qualification Not Established</u>	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:

X = DEFICIENCY

Documented Evidence of Qualification Adequate	_____
Adequate Similarity Between Equipment and Test Specimen Established	_____ <u>X</u> _____
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	_____ <u>X</u> _____
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	_____



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

NOTES:

The licensee description of the installed cable presented on the SCEW sheet does not provide sufficient information to establish identity between the installed and tested cables as required by either DOR Guidelines or IEEE-383-74.

SCEW

Test report

System
Component
Evaluation
Worksheet
I&E B. 79-01B

TEST SAMPLE DESCRIPTIONS

Instrumentation Cable

Single Conductor #16 AWG, 300 volt, 20 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

Data

Manufacturer:

Rockbestos

*Control Cable

Single Conductor #12 AWG, 600 volt, 30 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

Model or type

N/A

Power Cable

Single Conductor #6 AWG, 600 volt, 45 mils of
flame retardant XLPE insulation identified as
Rockbestos Firewalls III.

Function:

Control CABLE

* Also qualifies Firewall SIS (NEC Type SIS).

[1391]

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 deviation should be evaluated as part of the qualification documentation (see also Section 8.0 below).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

NOTES:

IEEE-383-74 Requires:

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 engineering practice.

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
	vertical flame test singles from cable assembly	2.5.6	1/C - 6, 4 or 2 AWG
	vertical tray flame test	2.5.4	7/C - 15, 14 or 12 AWG
Shielded pairs, triple or multi-core multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
	vertical tray flame test	2.5.4	
Control, signal, 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	
	vertical tray flame test	2.5.4	
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 flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001-15 000 V power cable 1/C triplex and multi-conductor	vertical tray flame test	2.5.4	6 AWG (2-LLV) 2/O or 4/O or 4/O (2-15LV)

Therefore this equipment is assigned to NRC Category IIa because similarity between tested and installed equipment has not been established.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ITEM NO. 97

ELECTRICAL THERMOCOUPLE CABLE LOCATED IN THE REACTOR BUILDING, VARIOUS
ELEVATIONS

KERITE MODEL THERMOCOUPLE CABLE 16 AWG

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 97

LICENSEE REFERENCE(S): 52

FUNCTION (PLANT ID): TEMPERATURE SIGNALS (95-13-193)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-47 [15]

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

R, T, QI, 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

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.
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

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 has not provided
 the document referenced nor is
 the reference description adequate
 to determine whether the report is available
 from other sources*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

EQUIPMENT ITEM NO. 98
MOTOR STARTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
GENERAL ELECTRIC MODEL CR207B223AAA
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 98
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MOTOR STARTER & DISCONNECT
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-48 [15]

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 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):
 - X 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ITEM NO. 99

CIRCUIT BREAKERS LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"

GENERAL ELECTRIC MODEL NTE20

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 99

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BRANCH CIRCUIT BREAKERS

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-49 [15]

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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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, X
Maintenance and Replacement Schedule Summary	7a, 7b, 7c



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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.
- ☒ 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 (ASSESSMENT ON-GOING)
- ☐ 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	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
<u>II.a</u> Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:
X = CATEGORY

I.a	Equipment Qualified	<u> </u>
I.b	Equipment Qualification Pending Modification	<u> </u>
II.a	Equipment Qualification Not Established	<u>X</u>
II.b	Equipment Not Qualified	<u> </u>
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u> </u>
III.a	Equipment Exempt From Qualification	<u> </u>
III.b	Equipment Not in the Scope of the Qualification Review	<u> </u>
IV	Documentation Not Made Available	<u> </u>



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

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 , BWR X.

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,
Combustion Engineering (CE) , General Electric (GE) X.

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):

X 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



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FRC Task No. 4.6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

EQUIPMENT ITEM NO. 100
POSITION SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
NAMCO MODEL SL3C58TW
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 100
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): MAIN STEAM VALVE POSITION INDICATION (POS 01-03, -04)
LICENSEE SUBMITTAL: SCEW(S): B-3, B-4 [33]

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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FRC Assignment No. 13
FRC Task No. 466

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

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.
- ☒ 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 (REPLACEMENT IF QUAL CANNOT BE SUBSTANTIATED)
- ☐ 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)

- | | |
|--|--------------------------------|
| <input checked="" type="radio"/> 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 |



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

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 DETAILED ANALYSIS SEE EQUIPMENT ITEM 50



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

LICENSEE RESPONSE TO NRC SER

X Qualified [14]

___ Qualification Assessment On-Going

___ To be Replaced by a Qualified Component

Rev. Date: April 2, 1982

[33]

Nine Mile Point Unit 1
Component Review Summary Sheet

Equipment: Main steam line outboard isolation valve position switch
(Pos 01-03 & Pos 01-04)

Manufacturer: Namco

Model: SLJC-58T-W

Safety Function: Reactor scram on main steam line isolation valve position

Qualification Discrepancy: Lack of documented qualification concerning
time/temperature aging

Justification for Continued Operation:

The switch provides a signal to the reactor protection system for reactor scram on main steam line position. There are two independent limit switches per valve and each switch provides an independent signal to the reactor protection system. Failure of the switch to generate a reactor scram on valve position would result in increased reactor pressure and power and a decrease in indicated reactor coolant level, all of which generates reactor scram signals for off normal values of these parameters. Mitigation of a high energy line break or loss of coolant accident is not dependent on these switches. These switches provide an anticipatory reactor trip due to loss of normal heat sink, the main condenser.

Although time/temperature aging analysis currently indicates limited qualifications based on conservative ambient temperatures, it is unlikely the switch would fail. Normal technical specification surveillance testing provides a means to monitor switch operability for age related failures.

Based on the above, continued operation is justified until the switch is qualified or replaced with a documented qualified position switch.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

LICENSEE RESPONSE TO NRC SER (Continued)

NOTES USED IN REVISION 4 [33]

- NOTE 1 — Test specimens in References 25 and 26 were ASCO Model No.'s 8300 B64F and 8300 B6LYF.
- NOTE 2 — Qualification assessment ongoing.
- NOTE 3 — Equipment was tested successfully to a higher radiation dose than that derived by engineering analysis.
- NOTE 4 — Insulation qualification per References 46 or 47 as applicable; assessment ongoing.
- NOTE 5 — All metallic components; not subject to thermal or radiation degradation at the specified levels.
- NOTE 6 X — Equipment will be replaced if qualification cannot be substantiated.
- NOTE 7 — Further equipment identification needed to assure applicability of test report.
- NOTE 8 — The 510 DU Trip/Calibration System is insensitive to pressure changes; a pressure qualification test is not considered necessary (RMT-Rpt 12770, Revision A).

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).

Although 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, it is appropriate to highlight for the Licensee and the NRC certain conclusions and concerns reached as a result of the review which require special attention. These concerns are summarized below.

- o The Licensee has not resolved the NRC's concern with respect to identification of safety-related systems and display instrumentation (see Section 4.3.1 of this report). In the SER dated June 8, 1981 [13], the NRC staff concluded that the safety-related systems information included in the Licensee's submittal of November 3, 1980 [1] was insufficient to verify that the six specified safety functions would be achieved. In its response to the SER, the Licensee deleted various systems from the list of safety-related systems. The other systems identified in the November 3, 1980 submittal remained on the list and the Licensee identified which of the six safety functions are performed by each system. The Licensee's list of systems remains insufficient to verify that all safety functions will be performed. In addition, the Licensee apparently misconstrued the NRC's position on Regulatory Guide 1.97. As noted in Appendix C of this report, deleting display instruments from environmental qualification because they are covered by Regulatory Guide 1.97 is not justified. Instruments which require qualification under IE Bulletin 79-01B must be qualified without regard to any additional requirements. It is recommended that a thorough review of plant safety analyses and emergency procedures be performed with regard to the safety functions necessary for LOCA and HELB accident mitigation. A complete and

comprehensive list of systems to be addressed for environmental qualification should be submitted to the NRC for review and approval. See Appendix C of this report for a detailed discussion of this concern.

- o It should be noted that the Licensee, in its response to the NRC SER, has not provided a schedule for completion of corrective actions other than "Qualify or Replace," "Qualification Assessment On-Going," or "To be Replaced by a Qualified Component" for numerous equipment items.

With respect to TMI Action Plan items, the Licensee provided the following information [16]:

"Your letter of January 27, 1982 requested additional information concerning environmental qualification of safety-related electrical equipment and TMI Action Plan equipment. The enclosed information is provided in response to your request.

TABLE II

TMI ACTION PLAN
EQUIPMENT INSTALLED AT NINE MILE POINT 1

NUREG 0737 CLARIFICA- TION ITEM	TITLE	DESCRIPTION	APPROXIMATE EQUIPMENT INSTALLATION DATE
II.B.1	Reactor Coolant Vent	i. Modified Power Supplies to Existing Reactor Head Vent System Isolation Valves ii. Will Provide New Emergency Condenser Vent to the Torus	Spring 81 June 82
II.B.2	Plant Shielding	Relocated Existing Instrumentation and Solenoid Valve to Areas of Lower Radiation	N/A
II.B.3	Post-Accident Sampling	Installed Post-Accident Sampling System for Reactor Coolant Sampling	Jan. 81
II.D.1	Valve Position Indication	Installed Acoustical Monitoring System for Relief and Safety Valves	March 80
II.E.4.2	Containment Isolation Dependability	Installed New Isolation Valves for Post-Accident Sampling Line and Torus to Radwaste Pump Downline No Provisions for Isolation of Vent and Purge Valves Provided	March 82 Generic BWROG Position
II.F.1	Accident-Monitoring		
	1. Noble Gas Monitor	Effluent Monitoring System to be Installed	Jan. 83
	2. Iodine/Particulate Sampling	Effluent Monitoring System to be Installed	Jan. 83
	3. Containment High Range Monitor	Installed Containment High Range Radiation Monitors	Jan. 82

TABLE II (cont'd)

NUREG 0737 CLARIFICA- TION ITEM	TITLE	DESCRIPTION	APPROXIMATE EQUIPMENT INSTALLATION DATE
	4. Containment Pressure	Installed Containment Pressure Monitors	Spring 81
	5. Containment Water Level	Installed Torus Water Level Instrumentation --	Spring 81
	6. Containment Hydrogen	No Action Required	N/A
II.F.2	Instrumentation for Detection of Inadequate Core Cooling	Installed Fuel Zone Level Instrumentation	Jan. 82
II.K.3	Final Recommendations B & O Task Force		
	14. Isolation Condenser Isolation Modification	None	None Required Per NRC-SER
	19. Interlock Recirculation Pump Modification	None	None Required Per NRC-SER"

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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General Electric, 00-Dec-78
NEDO-21617-A, Proprietary
5141. C. I. Odegaard
Qualified Life Test Report for Rosemount Model 510DU
Trip/Calibration System
Rosemount Inc., 08-Aug-79
12777D, Rev. A

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 the Licensee's submittal [1, 14].

The temperature and pressure profiles contained herein form the basis for the temperature and pressure noted by the Licensee in the "Environment Specifications" column on the Licensee's SCEW sheets.

Table A-1 in this appendix correlates plant areas or rooms with peak temperature/pressure values and corresponding environmental temperature and pressure curves.

Based on these considerations, each equipment item was evaluated with respect to the environmental service conditions presented in this appendix.

The Licensee's methodology for development of environmental service conditions was stated in Reference 1 as follows:

"A harsh environment inside containment will result from design basis LOCA's and HELB's. The limiting LOCA containment pressure and temperature profile is used to establish the limiting conditions inside containment. This information is taken directly from the FSAR LOCA analysis.

Outside containment the limiting condition will depend upon the locations of equipment relative to the break. A number of breaks in various systems and at various locations in the reactor building, steam tunnel and turbine building have been analyzed to establish limiting local service conditions as discussed in Section 4.2.

Limiting service conditions have been determined both inside and outside containment for postulated accident conditions including LOCA/HELB inside containment, and HELB outside containment. These service conditions include pressure, temperature, humidity, and radiation dose both inside and outside of containment.

Service Conditions Inside Containment

Thermal-Hydraulic Service Conditions:

The FSAR pressure and temperature profiles for the recirculation water line break are shown in Figures 4-12A and 4-12B. Limiting pressure-temperature profiles were developed to envelope steamline break conditions inside containment. These profiles, shown in Figures 4-13 through 4-15, include IEEE 323-1974 margins. More detailed analysis may be done to remove some conservations.

Chemical Spray Service Conditions:

The primary containment at NMP-1 contains no chemical spray system.

Radiation Environment:

The radiation environment inside containment was determined to be 5×10^7 RAD, Total Integrated Dose (TID), for 30 days. This TID was determined from the nomograph in 79-01B, Appendix B, suitably adjusted for BWR application. GE NEDO 24200, Rev. 1, was reviewed and found to be lower in its estimation of Total Integrated Dose (TID) than the 79-01B estimate. GE is reviewing their method and supporting data and their TID. If it is found adequate, it will be used.

Submergence:

NMPC has determined that submergence in the drywell is not a concern due to the low resistance flow path to the torus and the large torus-free volume.

Service Conditions Outside Containment

Thermal-Hydraulic Service Conditions:

Methods -

The COMPARE-MOD1 computer code was used to calculate upper bound pressure and temperature profiles for each break. More refined analysis would yield lower values for pressure and temperature at any point in time. For those breaks where mass and energy release information was available from the FSAR, this information was used. For those break locations where break flow had not been previously calculated, mass and energy release were conservatively calculated based on critical flow from the time of accident initiation until the time of inventory depletion or system isolation. All volumes were assumed to be initially at a pressure of 14.7 psia, 100°F and 0% relative humidity.

Results, in terms of limiting conditions, are summarized in Table 4-1. Turbine building transient profiles for the limiting break are shown in

Figures 4-1 through 4-3. In all cases, relative humidity rapidly rises to 100% and remains there until after the cooldown is completed.

In the reactor building, harsh environmental conditions are bounded by postulated breaks in 1) emergency cooling condenser system, 2) reactor cleanup system, and 3) instrument lines. Results for these cases are shown in Table 4-1 and Figures 4-4 through 4-12.

Radiation Environment:

The radiation environment outside containment was determined from the shielding design review of Nine Mile Point Nuclear Station Unit 1 performed in response to the TMI Short-Term Lessons Learned request. The report and letter were combined with the list of components to review the TID the component would receive at a given location. A blanket condition was chosen which would cover almost all components outside containment and would also be conservative. The TID determined from airborne activity was calculated at 5.8×10^5 RAD w/CAD (limiting condition). An average TID for direct irradiation of components by lines carrying contaminated fluid is about 2×10^5 RAD. Using a conservative estimate of 4×10^5 RAD and adding to the 5.8×10^5 yields a combination TID of 9.8×10^5 RAD. Therefore, less than 10^6 RAD TID is used as a blanket.

Certain areas exceed that estimate and have been so designated on the worksheet.

An overall dose to equipment in the reactor building from airborne was calculated based on allowable containment leak rates and the inventory as determined from initial calculations. The results, based on a semi-infinite cloud model are 3.4×10^5 RAD TID without CAD and 5.8×10^5 RAD TID with CAD.

Individual equipment conditions and locations were elevated to determine any direct shine dose which would be in addition to the airborne dose. This data was combined, as noted before, to yield the expected TID for equipment. The results are conservative based on both blanketing of lower level conditions and the fact that the NRC requires the dose from the noble gases to be considered twice. Another consideration is the fact that no credit is given for plateout of Halogens (Iodine)."

Accident Conditions Inside Primary Containment

For BWR plants, Section 4.1 of the DOR Guidelines states that the temperature component of the environmental service conditions within the drywell for the loss-of-coolant accident (LOCA) will be 340°F for 6 hours. This exposure is intended as a bounding condition to reflect the superheated steam release associated with the most severe main steam line break (MSLB) accident. Supplement 2 to IE Bulletin 79-01B states that a plant-specific

analysis may be used in lieu of 340°F for 6 hours. The Licensee has provided plant-specific temperature and pressure profiles for a LOCA event based on FSAR analysis. The Licensee has deleted the limiting pressure/temperature versus time profiles (Figures A-3, A-4, and A-5) to envelope steam line break conditions inside containment (see Licensee response below and Section 4.3.2.2 of this report); therefore, it is assumed that the LOCA profile represents the worst-case bounding accident condition.

With respect to primary containment service conditions and temperature margins applied to the primary containment accident profile, the Licensee stated [14]:

"The limiting temperature/pressure versus time profiles submitted were different from the profiles in the FSAR. Consequently, the staff requested that the related analysis be provided.

In lieu of providing the analysis, NMPC has revised the limiting containment temperature/pressure profiles to those provided in the FSAR for recirculation line break, with 20°F added as margin to account for the possibility of local superheat. The FSAR curves were previously provided in the November 3, 1980 submittal, and are summarized in Table 4-1 and shown in Figures 4-12A and 4-12B of this report.

NMPC considers use of the FSAR curves plus 20°F appropriate for the following reasons:

- A) The FSAR states that the actuation of containment sprays would eliminate the possibility of superheat temperature in the bulk of the drywell.
- B) The NRC Guidelines, Section 4.2, allows that the LOCA environment envelopes main steamline break environments in plants with automatic containment spray systems not subject to disabling single failures."

With regard to containment spray, the Licensee stated [14]:

"In conjunction with the review of environmental conditions resulting from line breaks inside containment, the staff requested NMPC verify that the NMP-1 containment spray system is not subject to a disabling single-component failure. The NMP-1 FSAR states the containment spray system consists of two independent and separate full capacity systems supplied by station reserve powers or from either of the two emergency diesel generators. One system will start automatically, the other is started by the operator in the control room.

The staff requested NMPC to address the effects of demineralized water spray in its equipment qualification efforts.

The NMP-1 containment spray system is the only source of spray. This spray is demineralized water taken from the torus. The spray header nozzles are arranged to minimize the impact on equipment and the nozzles produce fine spray droplets less than 1000 microns in size.

Various electrical components located inside containment were tested using various mixtures of chemical spray which, in fact, was a more severe simulation than the demineralized water spray. For example, boric acid and boron were used in the chemical spray/LOCA tests for Limiting Valve Operators, Raychem cables, and GE cables. Furthermore, various electrical components are sealed in NEMA 4 watertight enclosures which open from the bottom only; for example, the Dresser 1525VX relief valve and solenoid are contained in such enclosures. Therefore, spray could not affect operation of these components.

NMPC will consider the effects of demineralized water spray in its qualification of equipment located inside containment."

With regard to submergence, the Licensee stated [14]:

"The staff evaluation of the submergence service condition indicated that it was not evident that NMPC had considered the effects of all steamline breaks, both inside and outside containment.

The previous NMPC conclusion that accidental submergence of required Class 1E equipment in containment is not a concern was based on consideration of all line breaks in containment.

Consideration of submergence of equipment outside containment was not a requirement of I.E. Bulletin 79-01B. However, submergence outside containment does not appear to be a concern due to the limited amount of fluid discharged from postulated HELB's outside containment before break isolation, and because of equipment separation. For example, the lowest elevation in the NMP-1 reactor building is divided into four separate compartments; the safety related equipment at this elevation is redundant and located in separate compartments. NMPC will investigate the submergence service conditions further and submit any new information as it becomes available."

The Licensee has provided the following additional information in Reference 33:

"Individual system component evaluation work sheets have been revised to reflect data included in evaluation reports provided by our letter of March 2, 1982. The previously submitted evaluations and the enclosed revised work sheets may be subject to further revisions based on the following:

- (a) Integrated Radiation Dose - Values currently being specified on system components evaluation work sheets for radiation dose

qualifications are based on integrated doses in excess of the dose the equipment may receive for its required operating time. For example, equipment specified on the SCEW sheets with operating time of one hour are being evaluated for radiation qualification based on an integrated dose for 100 days or 180 days, depending where the equipment is located outside or inside the primary containment. Further analysis using integrated doses associated with the required operating times will reduce the radiation qualification limits by several orders of magnitude.

- (b) Normal Drywell Operating Temperature - Aging analyses performed to date have been based on a maximum operating temperature of 103°F. While this value is conservative with respect to equipment located within the reactor building, it may not accurately reflect the temperatures existing at various levels within the primary containment. Preliminary analysis at an assumed normal ambient drywell temperature of 135°F has shown minimal impact on the evaluation previously submitted.
- (c) Specific Area Dose Rates - For equipment located in the Reactor Building, general area radiation levels were specified. In some cases, a more detailed review with respect to equipment location may raise or lower the dose rates to which the equipment may be subject. This, coupled with the integrated doses assumed as discussed above, may result in revision to our existing evaluation and associated system component evaluation work sheets."

Table A-1

Limiting Pressure and Temperature Profiles/Plant Areas

<u>LOCATION</u>	<u>ELEV. (ft)</u>	<u>PEAK PRESSURE (psig)</u>	<u>PEAK TEMPERATURE (°F)</u>	<u>PROFILE</u>
1. Steam Tunnel	240	17.3	308	Fig. A-6 (Licensee Fig. 4-1)
2. Condenser Area of Turbine Building	243-297	2.3	285	Fig. A-7 (Licensee Fig. 4-2)
3. Remainder of Turbine Building	All Elevs.	0.4	133	Fig. A-8 (Licensee Fig. 4-3)
4. Emergency Cooling Condenser Area	340	0.5	307	Fig. A-9 (Licensee Fig. 4-4)
5. Containment Spray Heat Exchanger Area	318	5	305	Fig. A-10 (Licensee Fig. 4-5)
6. Emergency Cond. Isolation Valve Cubicle	298	9	305	Fig. A-11 (Licensee Fig. 4-6)
7. Emergency Cond. Return Valve Cubicle	291	9	278	Fig. A-12 (Licensee Fig. 4-7)
8. Cleanup System Cubicles	261	4	224	Fig. A-13 (Licensee Fig. 4-8)
9. Floor Area	340	0.4	205	Fig. A-14 (Licensee Fig. 4-9)
10. Floor Area	318	1	300	Fig. A-14 (Licensee Fig. 4-9)

Table A-1 (Cont.)

<u>LOCATION</u>	<u>ELEV. (ft)</u>	<u>PEAK PRESSURE (psig)</u>	<u>PEAK TEMPERATURE (°F)</u>	<u>PROFILE</u>
11. Floor Area	298	1	300	Fig. A-14 (Licensee Fig. 4-9)
12. Floor Area	281	1	212	Fig. A-14 (Licensee Fig. 4-9)
13. Floor Area	261	1	202	Fig. A-14 (Licensee Fig. 4-9)
14. East Instrument Room	281	1	212	Fig. A-14 (Licensee Fig. 4-9)
15. West Instrument Room	281	1	212	Fig. A-14 (Licensee Fig. 4-9)
16. Instrument Room	237	1	165	Fig. A-15 (Licensee Fig. 4-10)
17. Floor Area	237	1	126	Fig. A-16 (Licensee Fig. 4-11)
18. Floor Area	198	1	110	Fig. A-16 (Licensee Fig. 4-11)
19. Drywell	—	35	301	Fig. A-1 and A-2 (Licensee Figs. 4- 12A, B)

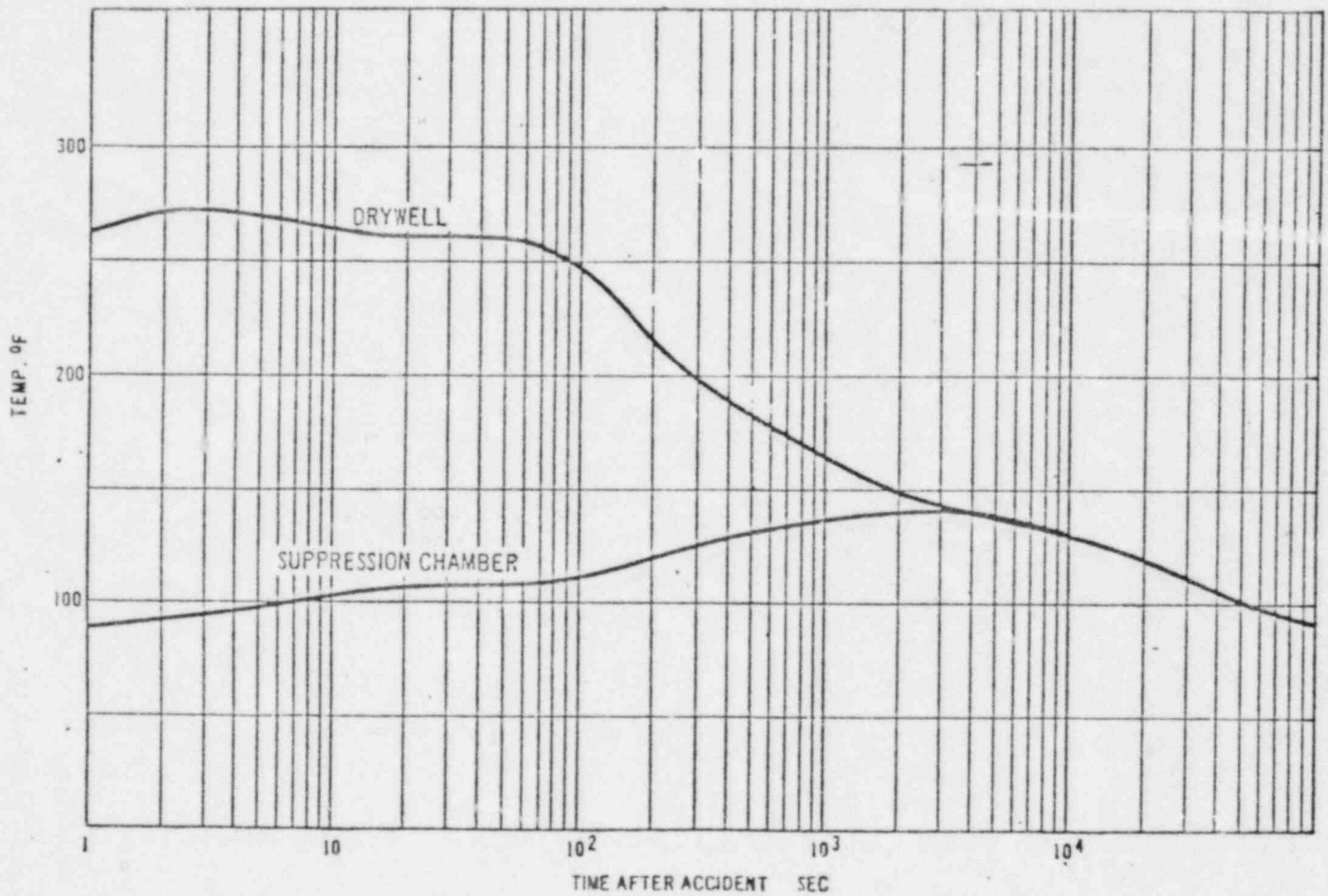


FIGURE SUPPLIED
BY THE LICENSEE

Figure A-1. LOCA Containment Temperature with Core Spray
Stretch Power (Licensee Figure 4-12A) [14]

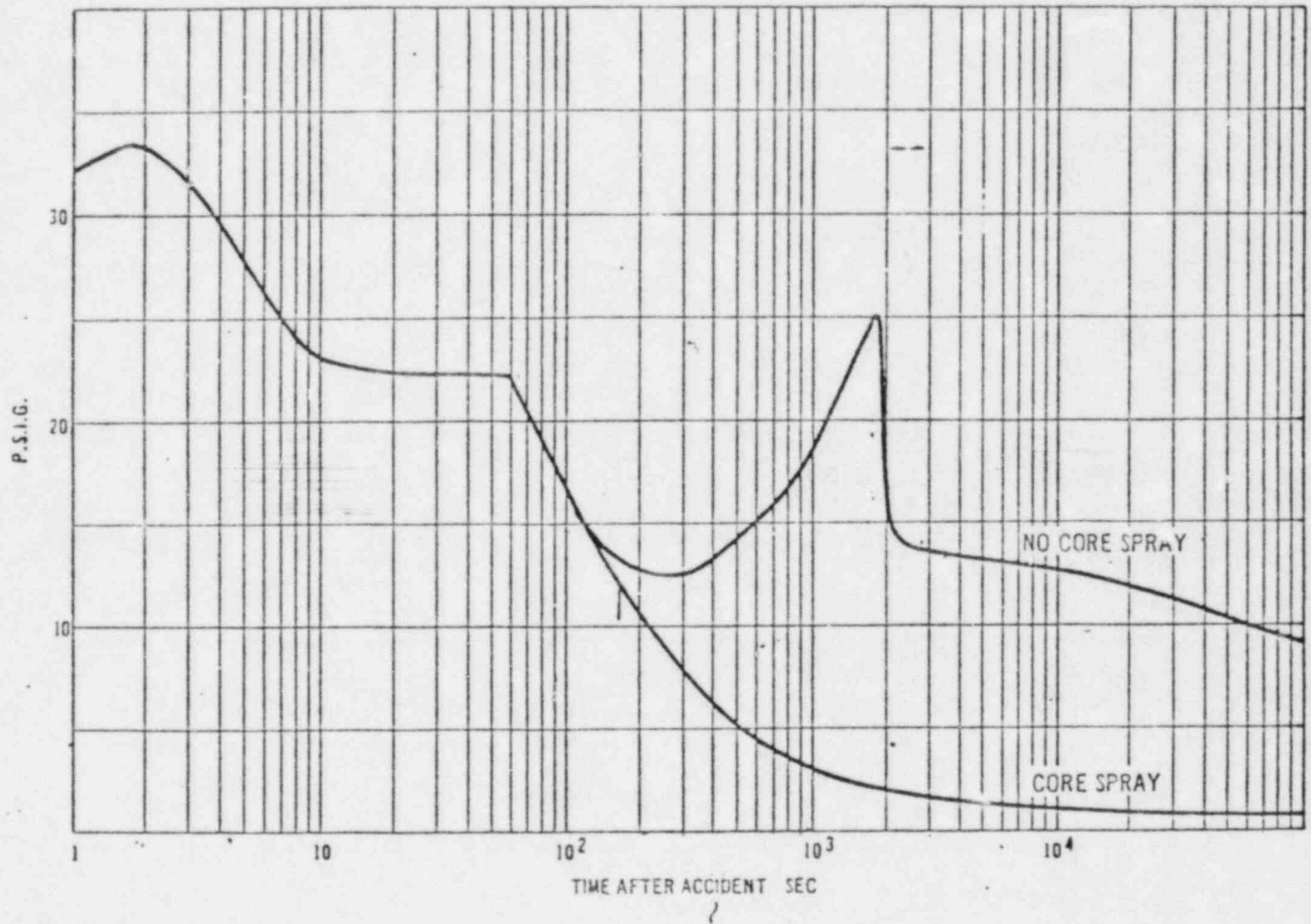


FIGURE SUPPLIED
BY THE LICENSEE

Figure A-2. LOCA Drywell Pressure Stretch Power
(Licensee Figure 4-12B) [14]

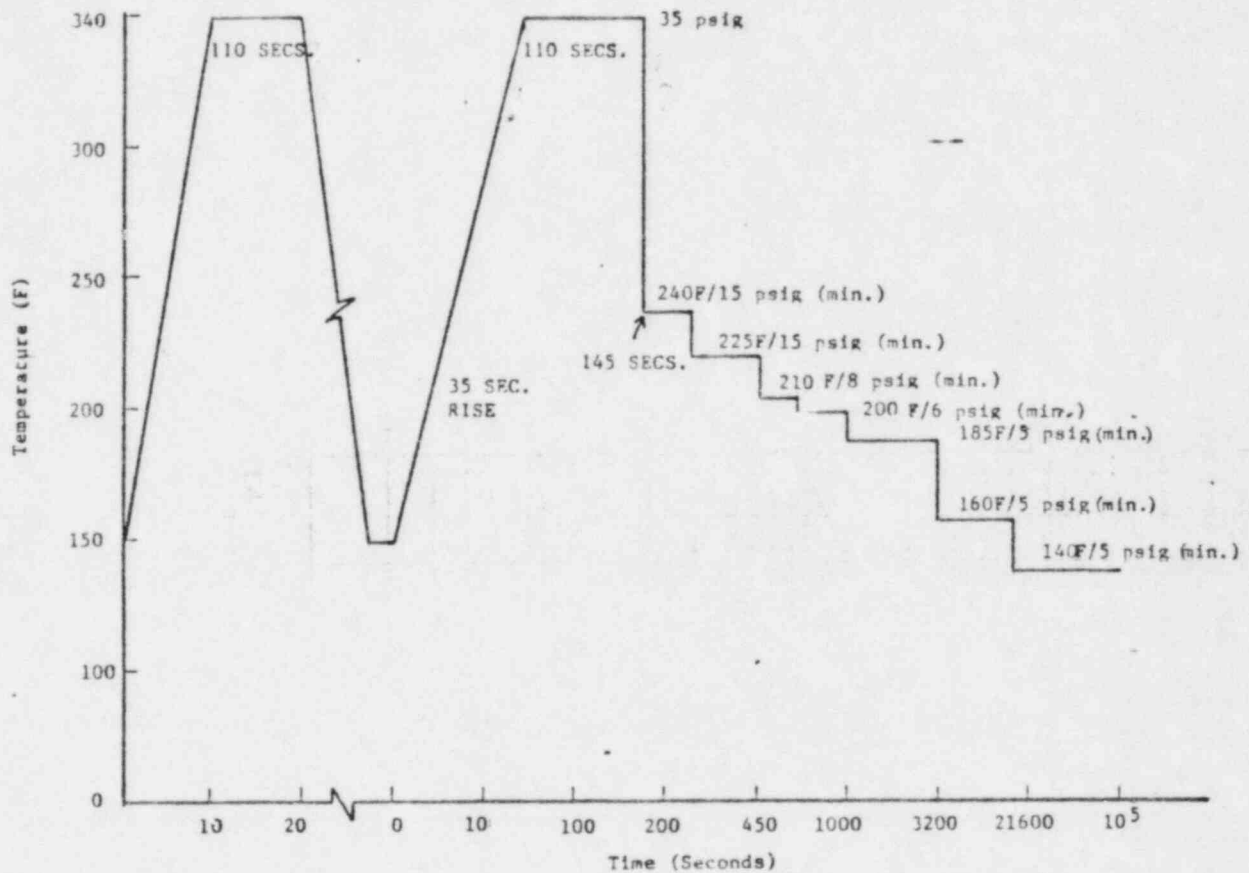


FIGURE SUPPLIED
BY THE LICENSEE

Figure A-3. LOCA/HELB Composite Temperature-Pressure Profile
for Small Steam Breaks Inside the Drywell [1]

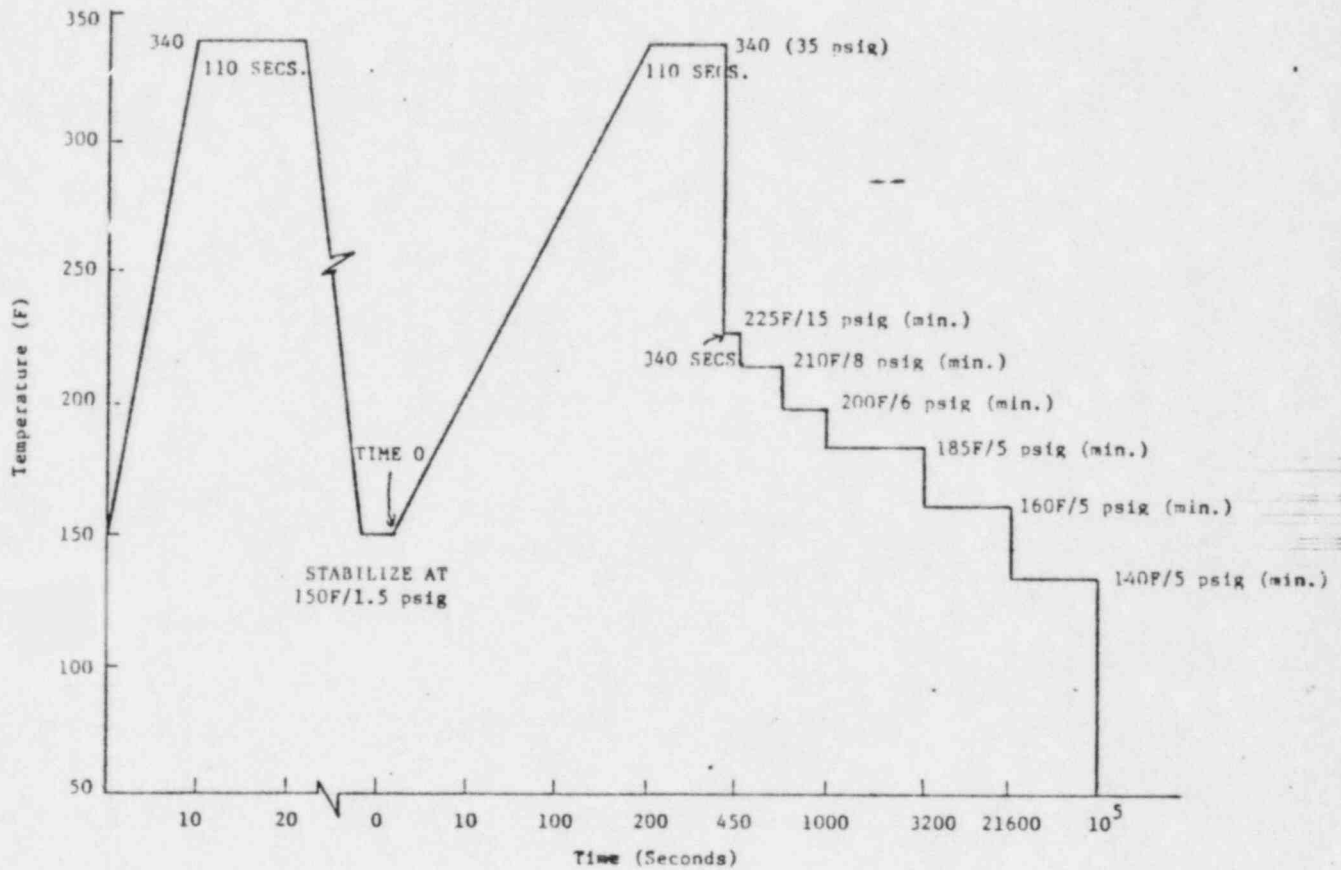


FIGURE SUPPLIED
BY THE LICENSEE

Figure A-4. LOCA/HFLB Composite Temperature-Pressure Profile for Medium Steam Breaks Inside the Drywell [1]

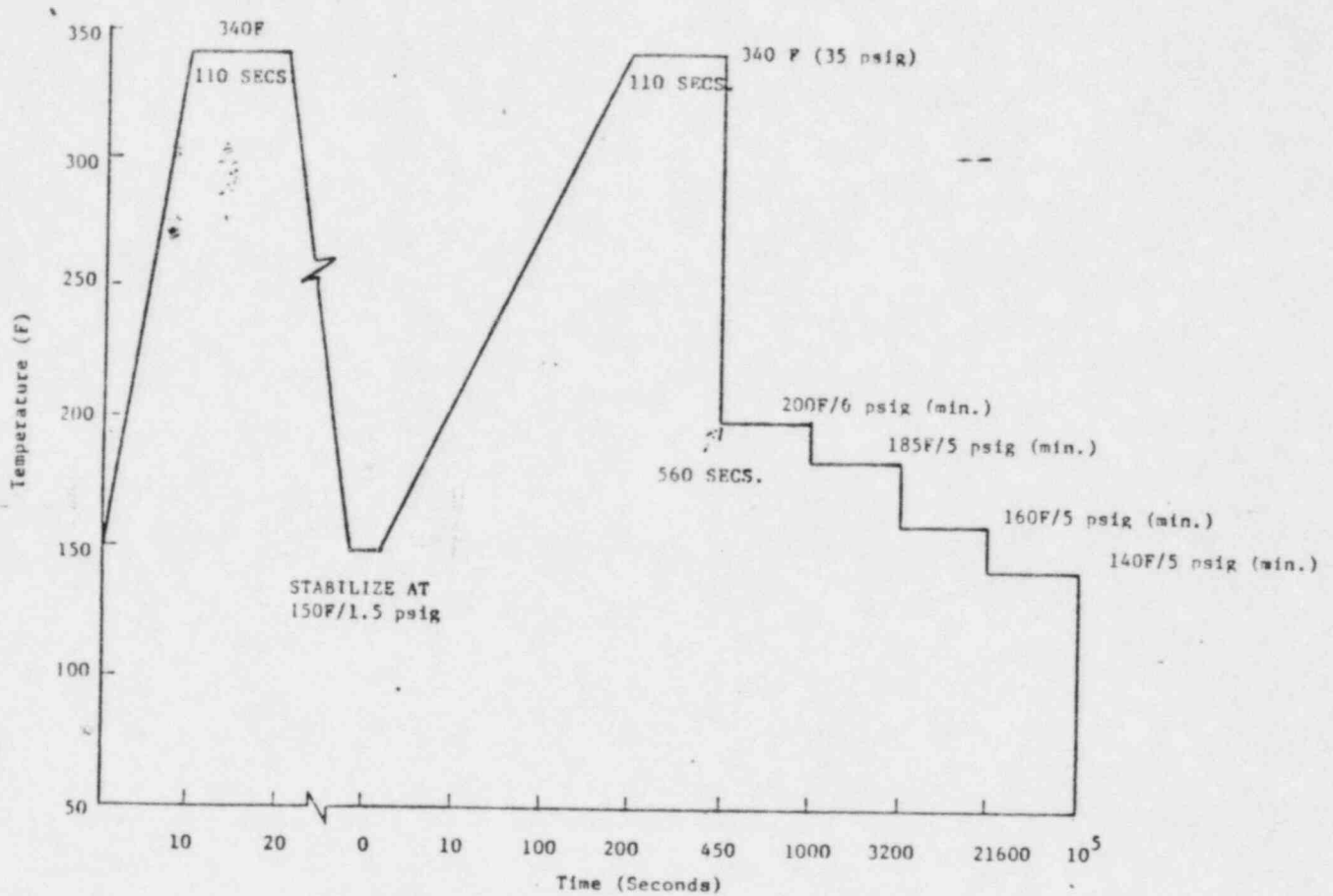


FIGURE SUPPLIED
BY THE LICENSEE

Figure A-5. LOCA/HELB Composite Temperature-Pressure Profile for Large Steam Breaks Inside the Drywell [1]

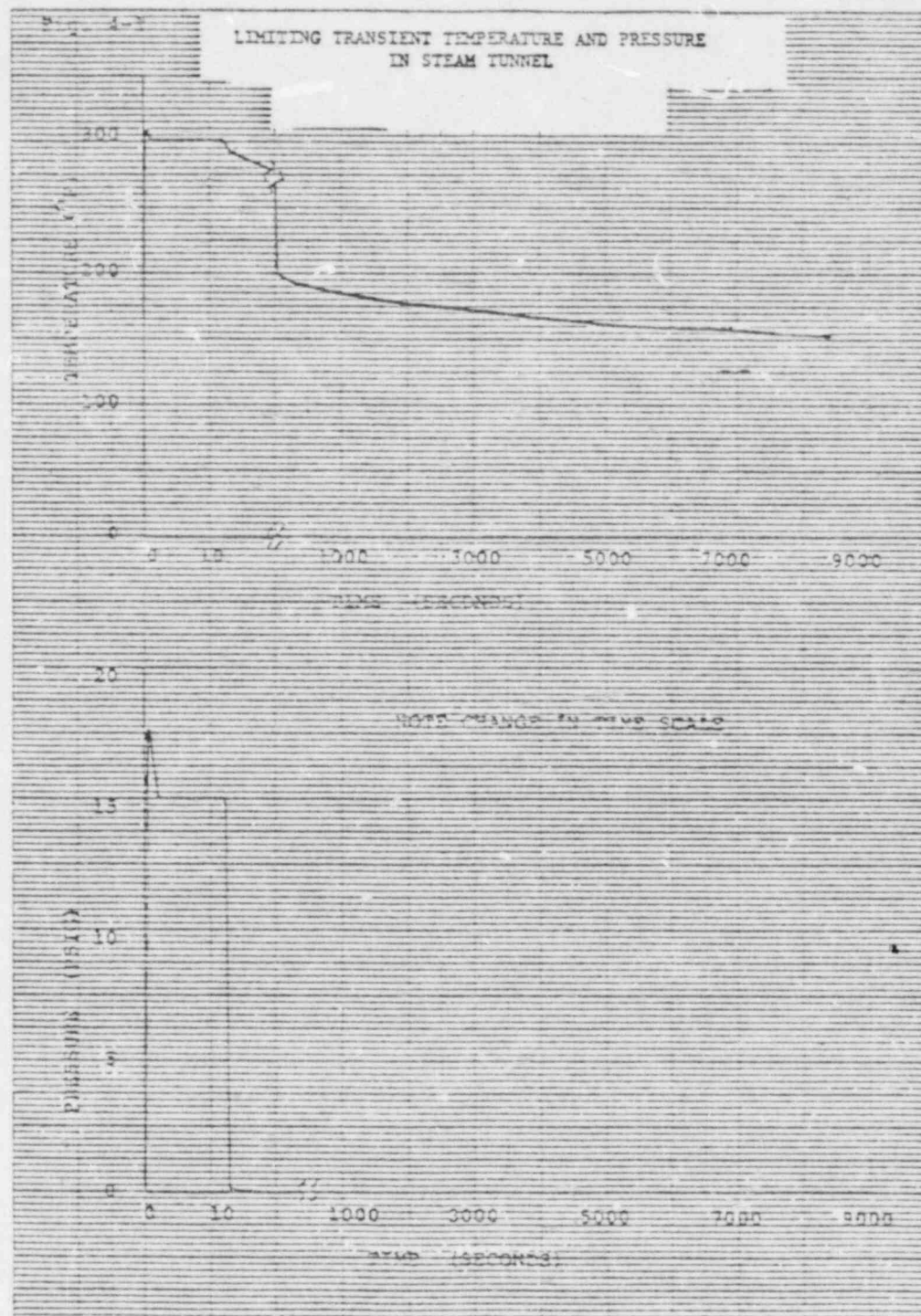


Figure A-6. Limiting Transient Temperature and Pressure in Steam Tunnel (Licensee Figure 4-1) [14]

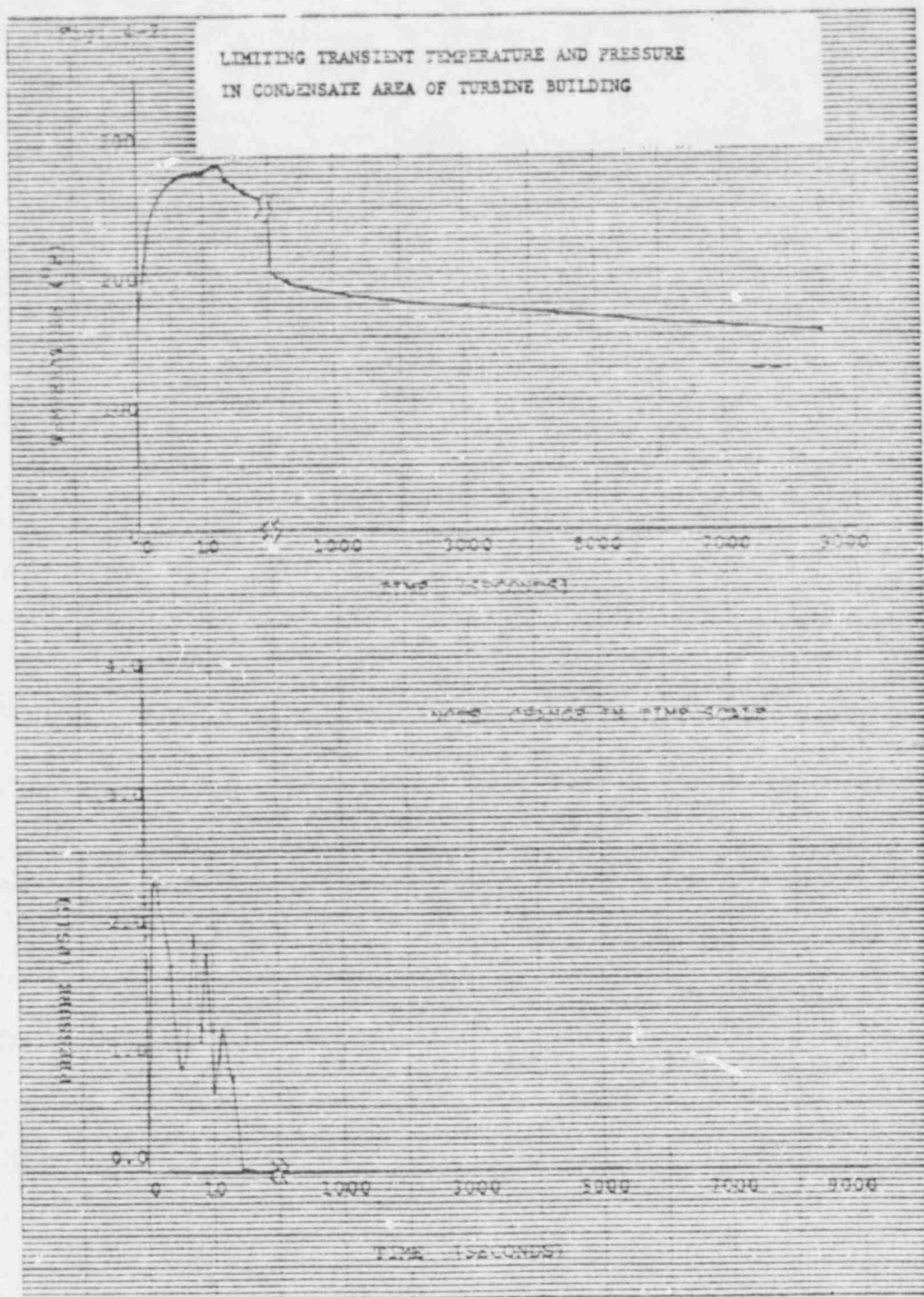


Figure A-7. Limiting Transient Temperature and Pressure
in Condensate Area of Turbine Building
(Licensee Figure 4-2) [14]

FIGURE SUPPLIED
BY THE LICENSEE

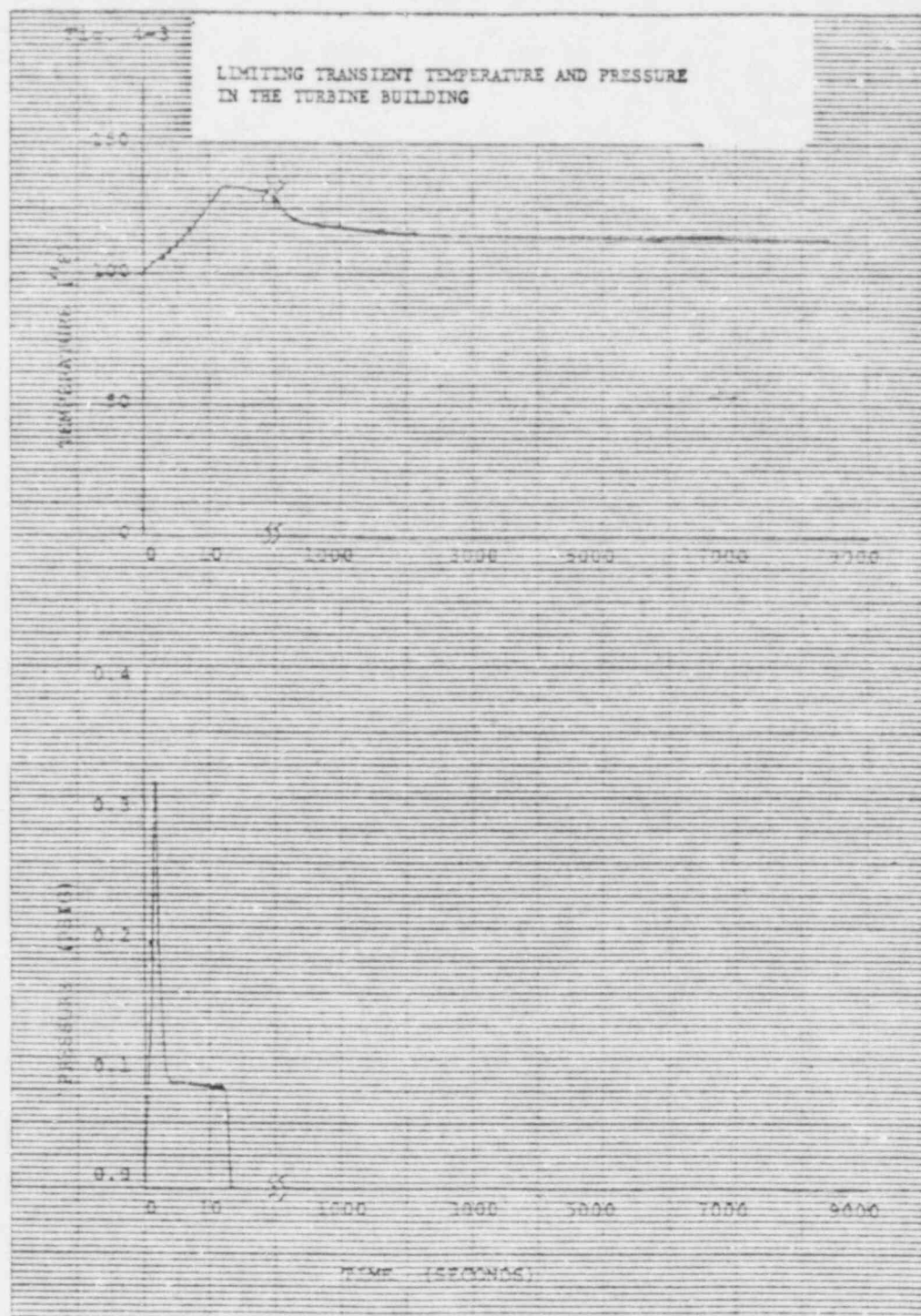


Figure A-8. Limiting Transient Temperature and Pressure in the Turbine Building (Licensee Figure 4-3) [14]

FIGURE SUPPLIED
BY THE LICENSEE

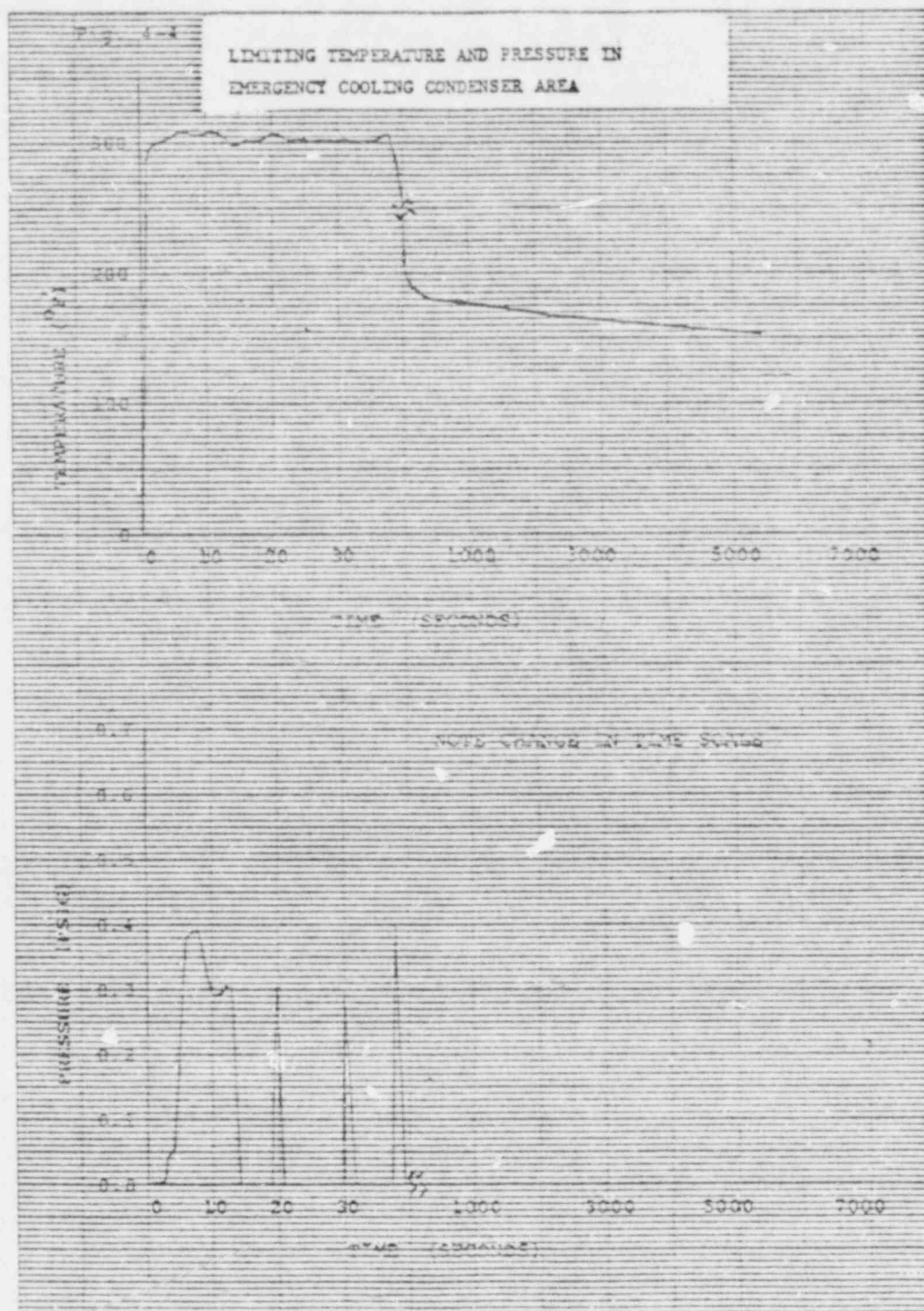


Figure A-9. Limiting Temperature and Pressure in
Emergency Cooling Condenser Area
(Licensee Figure 4-4) [14]

FIGURE SUPPLIED
BY THE LICENSEE

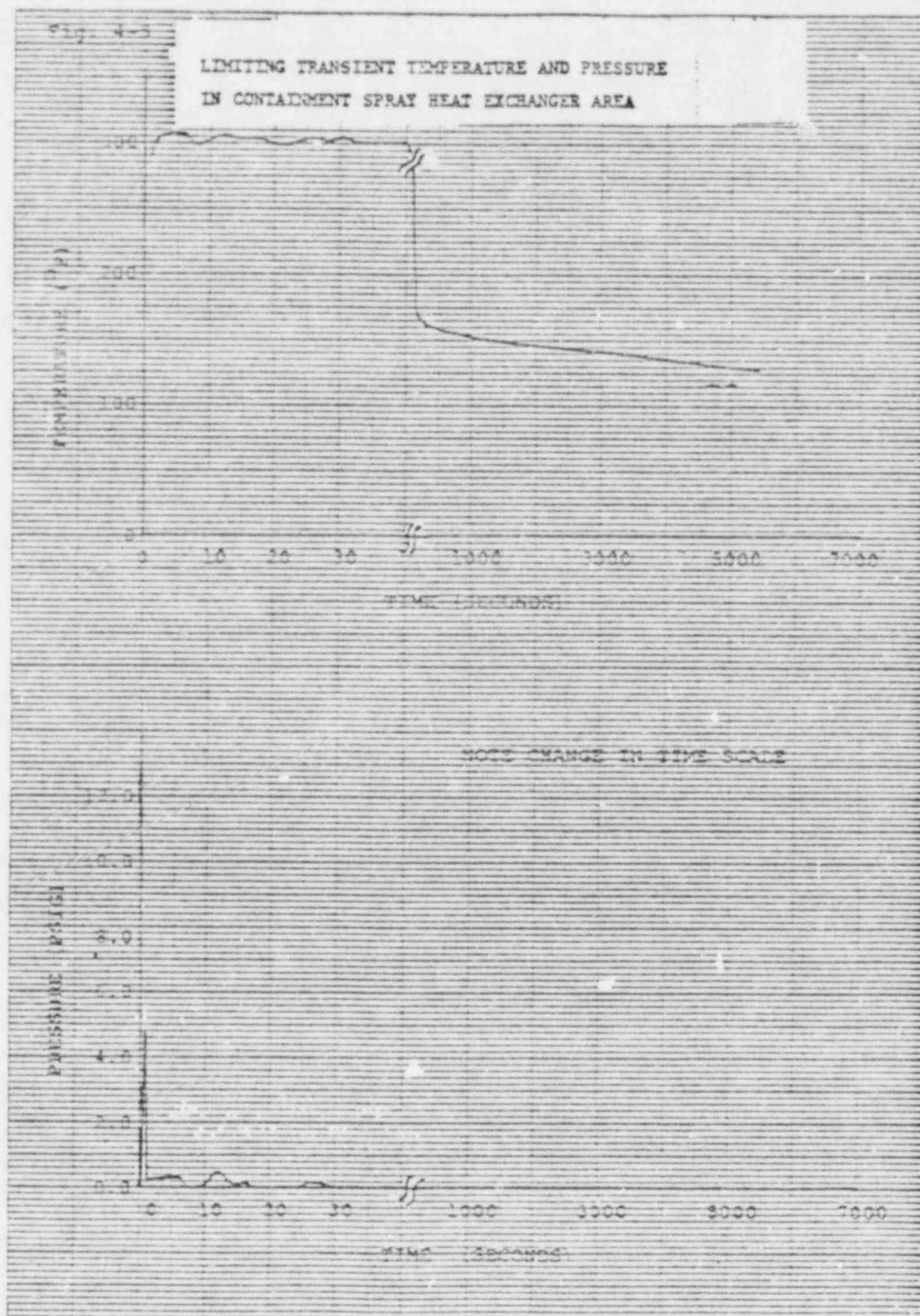


Figure A-10. Limiting Transient Temperature and Pressure
in Containment Spray Heat Exchanger Area
(Licensee Figure 4-5) [14]

FIGURE SUPPLIED
BY THE LICENSEE

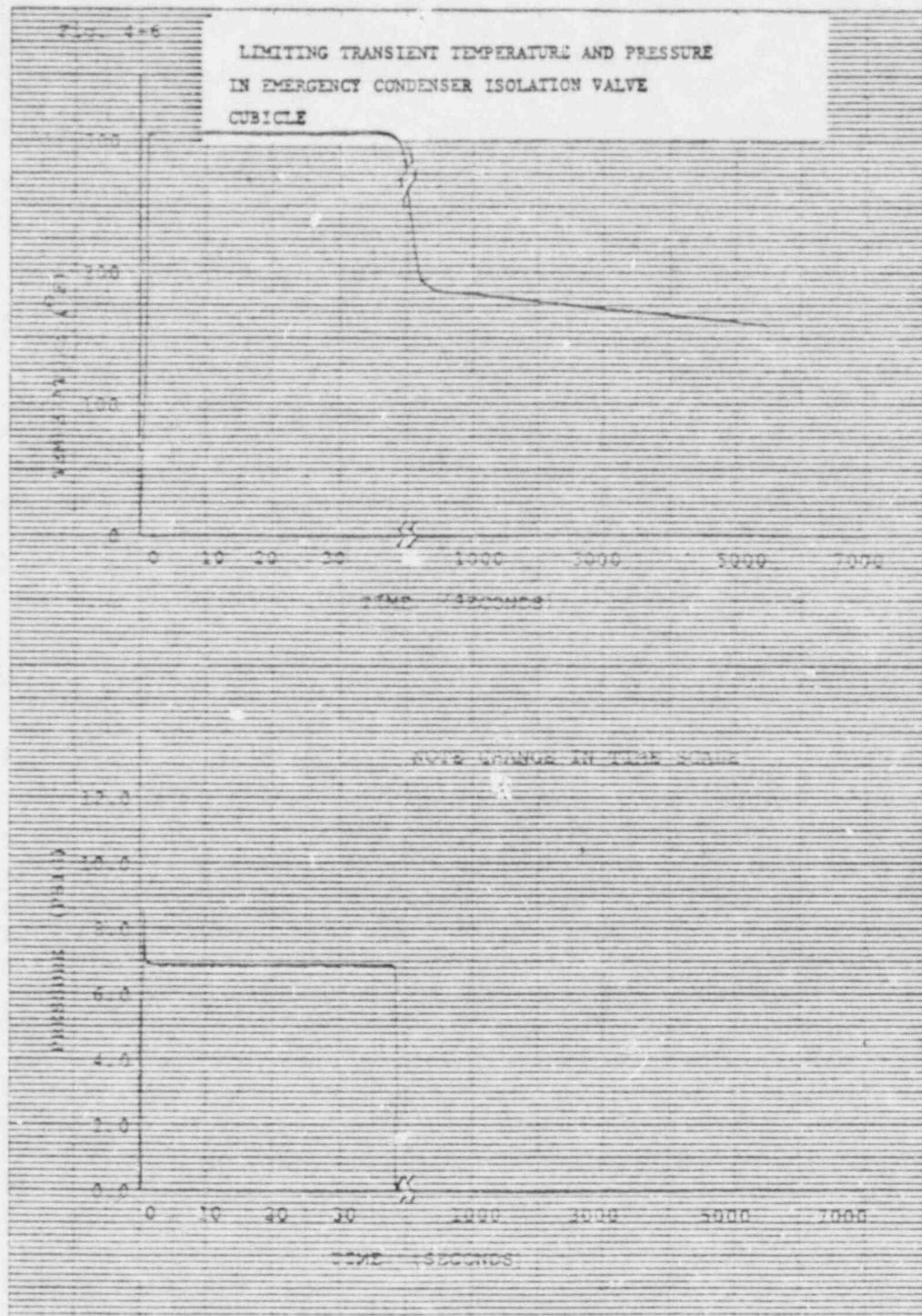


Figure A-11. Limiting Transient Temperature and Pressure in
Emergency Condenser Isolation Valve Cubicle
(Licensee Figure 4-6) [14]

FIGURE SUPPLIED
BY THE LICENSEE

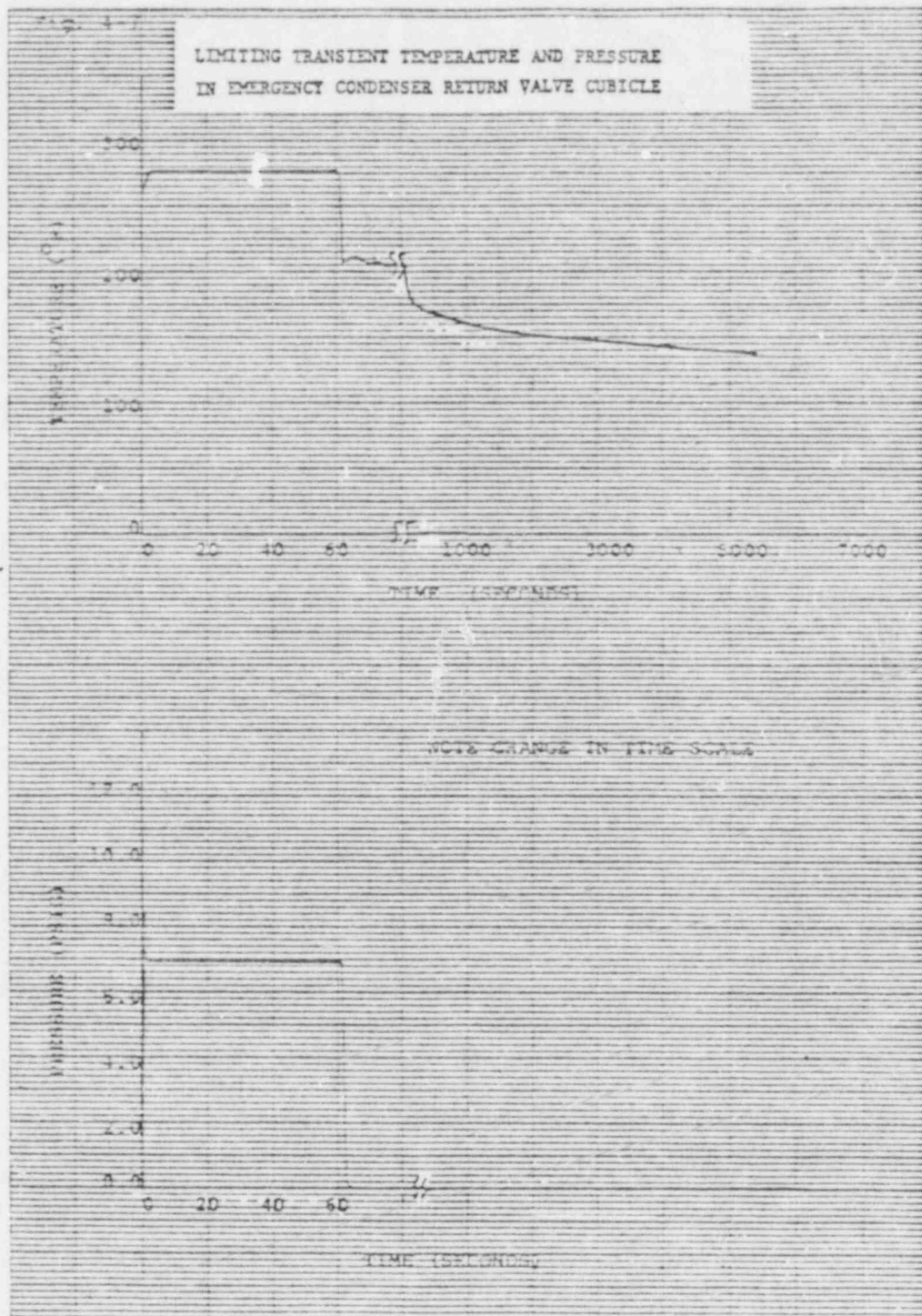


Figure A-12. Limiting Transient Temperature and Pressure
in Emergency Condenser Return Valve Cubicle
(Licensee Figure 4-7) [14]

FIGURE SUPPLIED
BY THE LICENSEE

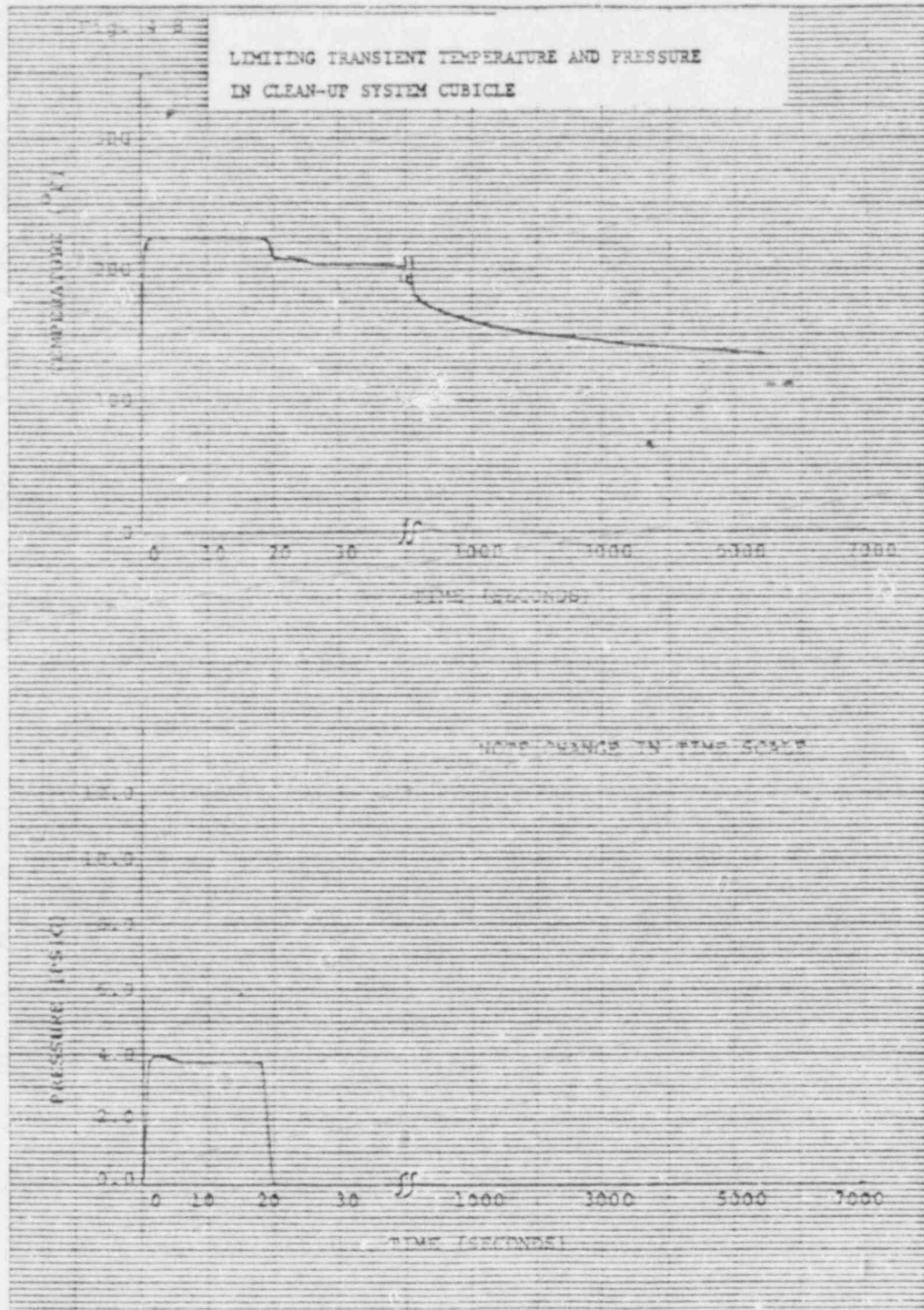


Figure A-13. Limiting Transient Temperature and Pressure in Cleanup System Cubicle (Licensee Figure 4-8) [14]

FIGURE SUPPLIED
BY THE LICENSEE

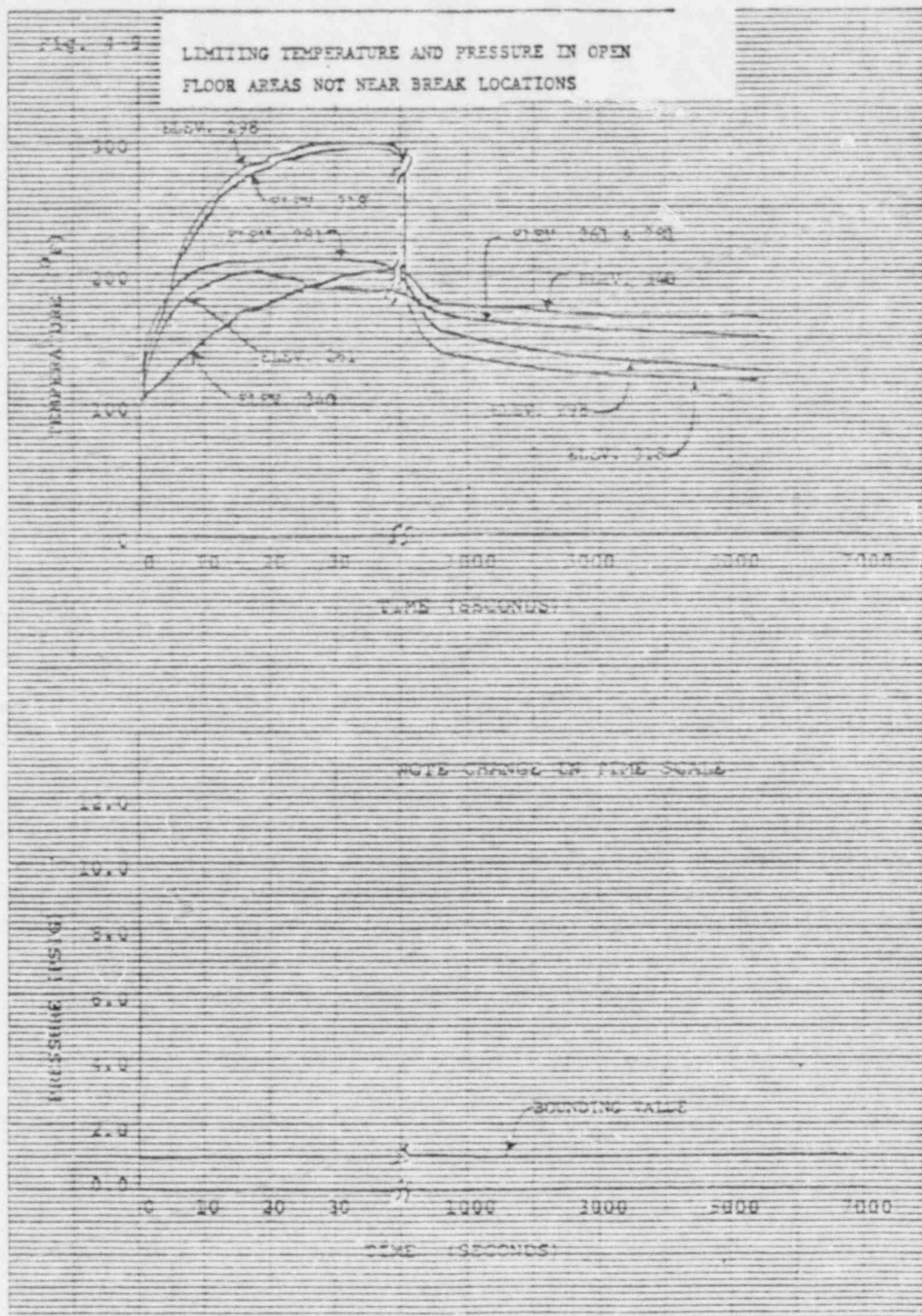


Figure A-14. Limiting Temperature and Pressure in Open Floor Areas
Areas Not Near Break Location (Licensee Figure 4-9) [14]

FIGURE SUPPLIED
BY THE LICENSEE

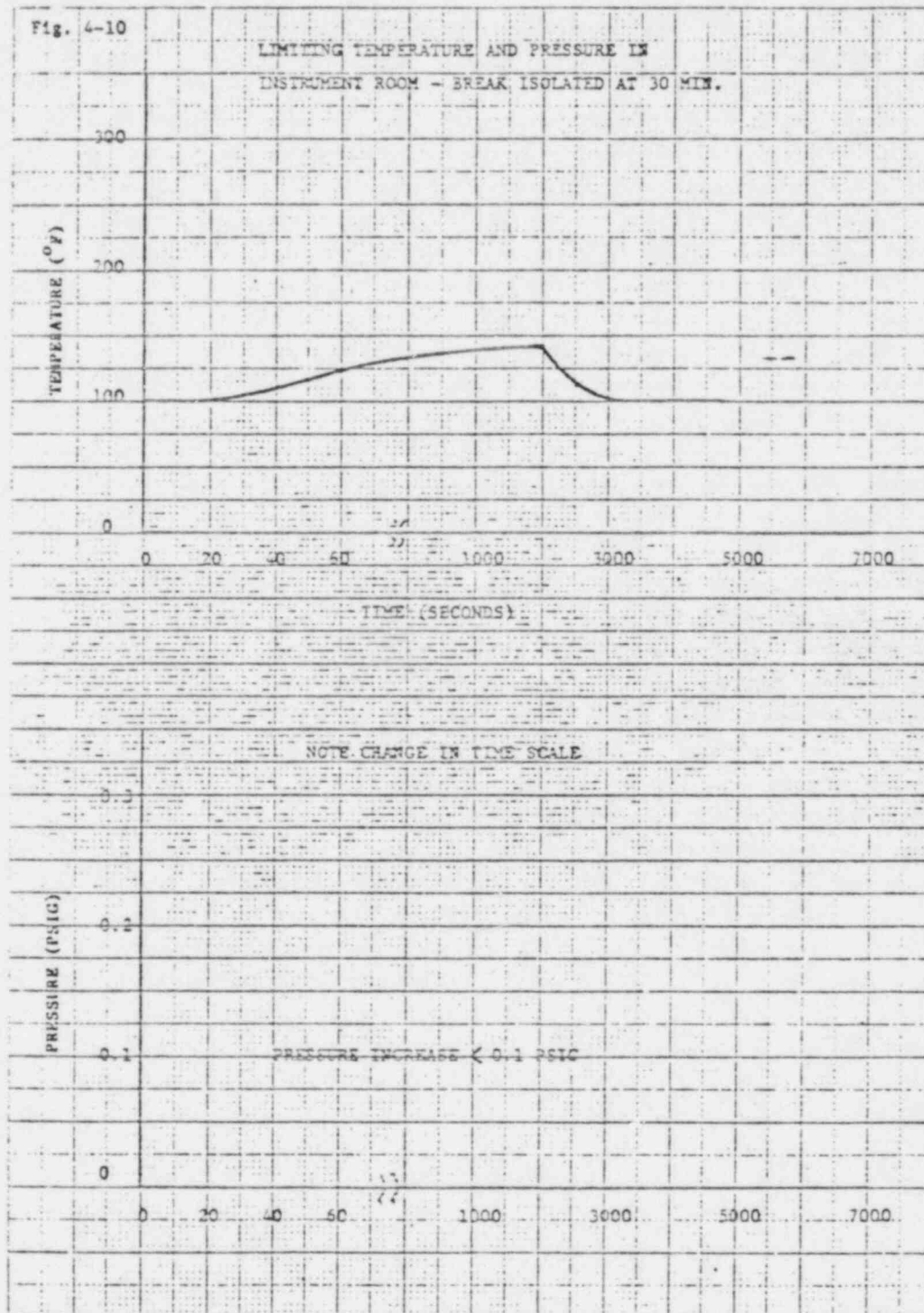


Figure A-15. Limiting Temperature and Pressure in
Instrument Room - Break Isolation at 30 Min.
(Licensee Figure 4-10) [14]

FIGURE SUPPLIED
BY THE LICENSEE

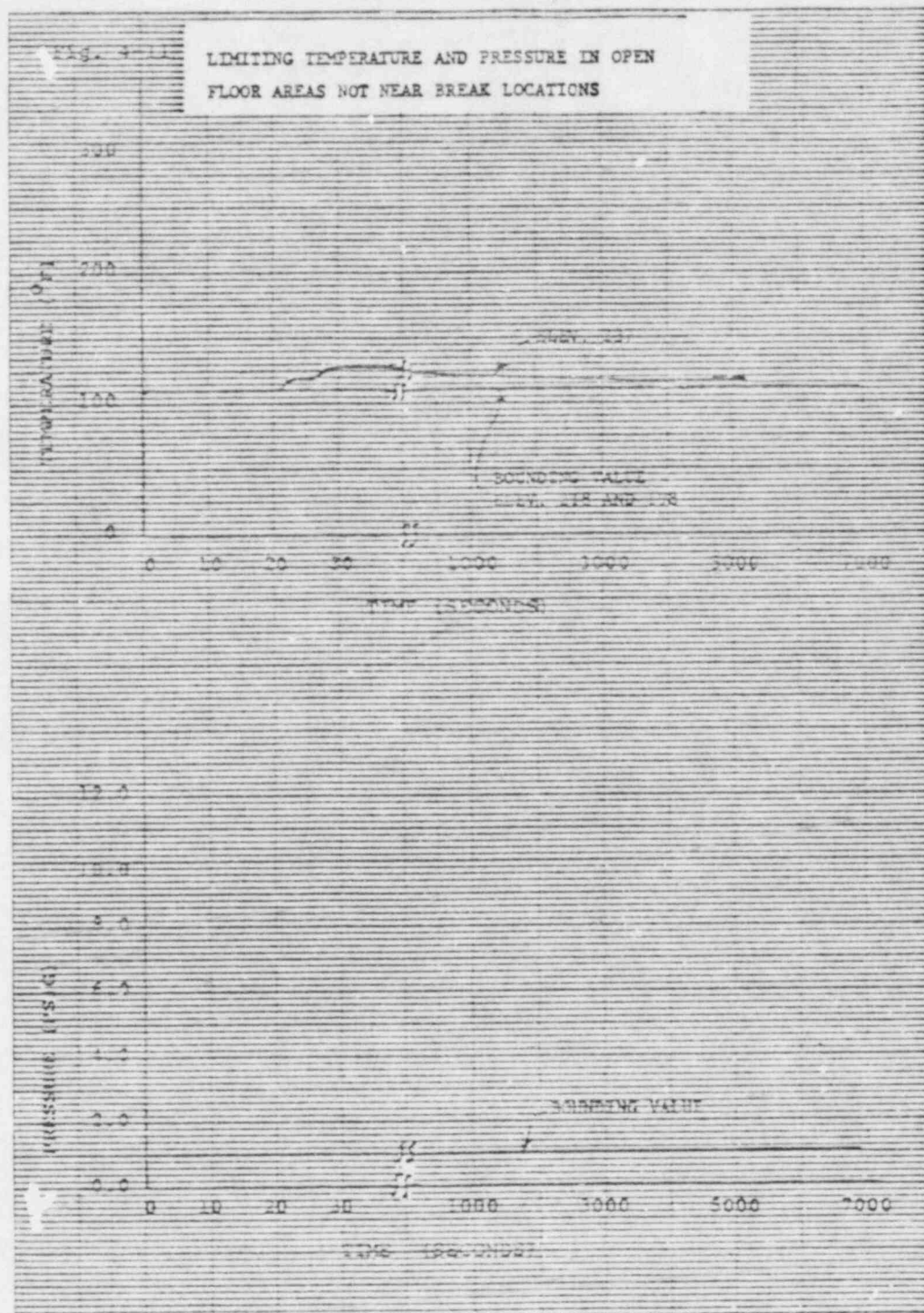


Figure A-16. Limiting Temperature and Pressure in Open Floor Areas Not Near Break Locations (Licensee Figure 4-11) [14]

APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

The following table lists the groupings of safety-related electrical equipment items for the Nine Mile Point Unit 1 plant. 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 [14, 15, 33].

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 CLEAN UP SYSTEM CUBICLES, ELEV. 261'0"
 LIMITORQUE MODEL SB-1
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 1
 LICENSEE REFERENCE(S): 43
 FUNCTION (PLANT ID): REACTOR CLEANUP OUTLET ISOLATION VALVE (IV 33-04)
 LICENSEE SUBMITTAL: SCEW(S): B-18 [33]

EQUIPMENT ITEM NO. 2
 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT
 LIMITORQUE MODEL SB; SIZES 0, 4
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 2
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MAIN STEAM ISOLATION VALVE (IV 01-02, IV 01-01,
 VI-33-02, IV 33-01)
 LICENSEE SUBMITTAL: SCEW(S): B-1, B-2 [33]
 FUNCTION (PLANT ID): REACTOR CLEANUP OUTLET ISOLATION VALVE (IV 33-01, -02)
 LICENSEE SUBMITTAL: SCEW(S): B-17, 19 [33]

EQUIPMENT ITEM NO. 3
 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT
 LIMITORQUE MODEL SMB3
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 3
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): CORE SPRAY LOOP 11 INLET ISOLATION VALVE B (IV 40-11, -10)
 LICENSEE SUBMITTAL: SCEW(S): F-5, F-6 [33]

EQUIPMENT ITEM NO. 4
 MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING
 LIMITORQUE MODEL SMB00
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 4
 LICENSEE REFERENCE(S): 662
 FUNCTION (PLANT ID): CORE SPRAY BYPASS ISOLATION VALVE (IV-40-05, IV 40-06)
 LICENSEE SUBMITTAL: SCEW(S): F-4, F-15 [33]

EQUIPMENT ITEM NO. 5
 MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT SPRAY HEAT EXCHANGER AREA
 LIMITORQUE MODEL SMBO
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 5
 LICENSEE REFERENCE(S): 662
 FUNCTION (PLANT ID): CONTAINMENT SPRAY HEAT EXCHANGER WATER ISOLATION (IV
 93-27, IV 93-28, IV 93-26, IV 93-25, IV 93-50, IV 93-49)
 LICENSEE SUBMITTAL: SCEW(S): N-11 THROUGH N-16 [33]

EQUIPMENT ITEM NO. 6
 MOTORIZED VALVE ACTUATOR LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE
 CUBICLE
 LIMITORQUE MODEL SMB2
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 6
 LICENSEE REFERENCE(S): 43
 FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE (IV 39-08, IV 39-07,
 IV 39-09)
 LICENSEE SUBMITTAL: SCEW(S): B-1, B-9, B-11 [33]

EQUIPMENT ITEM NO. 7
 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT
 LIMITORQUE MODEL SMB; SIZES 000, 2, 3
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 7
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): DRYWELL EQUIPMENT DRAIN PUMP DISCHARGE ISOLATION VALVE
 (IV 83.1-09, -11)
 LICENSEE SUBMITTAL: SCEW(S): D-4, D-5 [33]
 FUNCTION (PLANT ID): CORE SPRAY LOOP #12 INLET ISOLATION VALVE A VALVE OPERATION
 (IV 40-09, -01)
 LICENSEE SUBMITTAL: SCEW(S): F-17, F-16 [33]

EQUIPMENT ITEM NO. 8
 MOTORIZED VALVE ACTUATOR LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE
 CUBICLE
 LIMITORQUE MODEL SMB; SIZES 000, 2
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 8
 LICENSEE REFERENCE(S): 662
 FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE (IV 39-10)
 LICENSEE SUBMITTAL: SCEW(S): B-12 [33]
 FUNCTION (PLANT ID): DRYWELL N2 VENTILATION & FILL ISOLATION VALVE (IV 201-31)
 LICENSEE SUBMITTAL: SCEW(S): D-9 [33]

EQUIPMENT ITEM NO. 9
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 9
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): VENTILATION & PURGE ISOL. VALVE OPERATION (IV 201-07)
LICENSEE SUBMITTAL: SCEW(S): E-1 [33]
FUNCTION (PLANT ID): DRYWELL AIR VENTILATION & PURGE ISOL. VALVE OPERATION
(IV 201-09)
LICENSEE SUBMITTAL: SCEW(S): D-2 [33]
FUNCTION (PLANT ID): VENTILATION & PURGE ISOL. VALVE OPERATION (IV 201-17)
LICENSEE SUBMITTAL: SCEW(S): E-8 [33]

EQUIPMENT ITEM NO. 10
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
LAWRENCE MODEL 26DCSWPS
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 10
LICENSEE REFERENCE(S): 23
FUNCTION (PLANT ID): DRYWELL OXYGEN SAMPLING VALVE (IV 201.2-26, IV 201.2-29,
IV 201.2-25, IV 201.2-23, IV 201.2-24, IV 201.2-30,
IV 201.2-28, IV 201.2-27)
LICENSEE SUBMITTAL: SCEW(S): D-17 THROUGH D-22, E-9, E-10 [33]

EQUIPMENT ITEM NO. 11
SOLENOID VALVE LOCATED IN THE STEAM TUNNEL
DECCO MODEL 24166
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 11
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM BYPASS ISOLATED VALVE (SV 01-05, SV 01-06)
LICENSEE SUBMITTAL: SCEW(S): D-6, B-P [33]

EQUIPMENT ITEM NO. 12
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
DECCO MODEL 24166
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT SPRAY INLET ISOLATION VALVE (SV 80-36,
SV 80-16, SV 80-35, SV 80-15)
LICENSEE SUBMITTAL: SCEW(S): D-1, D-14, D-15, D-16 [33]

EQUIPMENT ITEM NO. 13
 SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
 ASCO MODEL HVA904058A
 REQUIRED OPERATING TIME: 28 HOUR
 TER CHECKSHEET NO. 13
 LICENSEE REFERENCE(S): 24, 4673
 FUNCTION (PLANT ID): CONTROL ROD DRIVE SCRAM DUMP CONTROL (SV NC-15A,
 SV NC-16A, SV NC-15B, SV NC-16B)
 LICENSEE SUBMITTAL: SCEW(S): R-1 THROUGH R-4 [33]

EQUIPMENT ITEM NO. 14
 SOLENOID VALVE LOCATED IN THE CONTAINMENT
 GENERAL ELECTRIC MODEL 1525VX
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 14
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): VALVE PILOT AND POSITION SWITCH (POS NR-108A THROUGH
 NR-108F)
 LICENSEE SUBMITTAL: SCEW(S): C-3 THROUGH C-8 [33]

EQUIPMENT ITEM NO. 15
 SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
 ASCO MODEL 8300B61RU
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 15
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): TORUS N2 MAKEUP AND BLEED VALVE CONTROL (SV 201.2-06,
 SV 201.2-33)
 LICENSEE SUBMITTAL: SCEW(S): E-4, E-6 [33]

EQUIPMENT ITEM NO. 16
 SOLENOID VALVE LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE
 ASCO MODEL WPLB300B72F
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 16
 LICENSEE REFERENCE(S): 1552, 24
 FUNCTION (PLANT ID): DRYWELL N2 MAKEUP AND BLEED VALVE OPERATION
 (SV 201.2-32, SV 201.2-03)
 LICENSEE SUBMITTAL: SCEW(S): D-10, D-12 [33]

EQUIPMENT ITEM NO. 17
 SOLENOID VALVE LOCATED IN THE EMERGENCY CONDENSER RETURN VALVE AREA
 ASCO MODEL 8300 SERIES
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 17
 LICENSEE REFERENCE(S): 1552, 4025
 FUNCTION (PLANT ID): EMERGENCY CONDENSER VALVE PILOT (SV 39-06, SV 39-05)
 LICENSEE SUBMITTAL: SCEW(S): B-14, B-15 [33]

EQUIPMENT ITEM NO. 18
 SOLENOID VALVE LOCATED IN THE REACTOR BUILDING
 ASCO MODEL WPLB8300B68F
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 18
 LICENSEE REFERENCE(S): 1552, 24
 FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE OPERATOR (SV 68-09C, -08C, -10C)
 LICENSEE SUBMITTAL: SCEW(S): E-15 [33]

EQUIPMENT ITEM NO. 19
 TRIP UNIT LOCATED IN THE REACTOR BUILDING
 ROSEMOUNT MODEL 510DU
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 19
 LICENSEE REFERENCE(S): 22
 FUNCTION (PLANT ID): DRYWELL PRESSURE TRIP TO RPS (201.2-476A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): H-21 THROUGH H-24 [33]
 FUNCTION (PLANT ID): EMERGENCY CONDENSER FLOW TRIP TO RPS (36-06A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): H-25 THROUGH H-28 [33]
 FUNCTION (PLANT ID): STEAM LINE FLOW TRIP TO RPS (01-26A THROUGH H)
 LICENSEE SUBMITTAL: SCEW(S): H-29 THROUGH H-36 [33]

EQUIPMENT ITEM NO. 20
 TRIP UNIT LOCATED IN THE REACTOR BUILDING
 ROSEMOUNT MODEL 510DU
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 20
 LICENSEE REFERENCE(S): 22
 FUNCTION (PLANT ID): REACTOR LEVEL TRIP UNIT (36-03A, C, D; 36-04A, B, C, D; 36-05A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): G-17 THROUGH 28; G-36 THROUGH G-40 [33]
 FUNCTION (PLANT ID): REACTOR PRESSURE TRIP UNIT PRESSURE TRIP (36-07A, B, C, D; 36-08A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): G-28 THROUGH G-36; G-40 THROUGH G-48 [33]

EQUIPMENT ITEM NO. 21
 TRANSDUCER, E/P LOCATED IN THE REACTOR BUILDING
 FISHER CONTROLS MODEL 546 4154882
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 21
 LICENSEE REFERENCE(S): 4719, 29
 FUNCTION (PLANT ID): OPERATES TEMPERATURE CONTROL VALVE (E/P 70-137)
 LICENSEE SUBMITTAL: SCEW(S): J-4 [33]

EQUIPMENT ITEM NO. 22
 THERMOCOUPLE LOCATED IN THE REACTOR BUILDING
 PALL TRINITY MICRO MODEL TYPE CU/6
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 22
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): RBCLC HEAT EXCHANGE OUTLET TEMPERATURE CONTROL (TE 70-23)
 LICENSEE SUBMITTAL: SCEW(S): J-5 [33]

EQUIPMENT ITEM NO. 23
 PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
 GE/MAC MODEL 551
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 23
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): TRANSMITS CONTAINMENT SPRAY PUMP DISCHARGE PRESSURE (PT 80-75)
 LICENSEE SUBMITTAL: SCEW(S): N-4 [33]

EQUIPMENT ITEM NO. 24
 PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
 GE/MAC MODEL 551 4532K11001
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 24
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): TRANSMITS CONTAINMENT SPRAY PUMP DISCHARGE PRESSURE (PT 80-69, 80-47, 80-54)
 LICENSEE SUBMITTAL: SCEW(S): N-1, N-2, N-3 [33]

EQUIPMENT ITEM NO. 25
 PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 GE/MAC MODEL 551 JB394616611
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 25
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): PRESSURE INDICATION (PT ID-46A, B)
 LICENSEE SUBMITTAL: SCEW(S): G-1, G-2 [33]

EQUIPMENT ITEM NO. 26
 PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 GE/MAC MODEL 551 LB484611175
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 26
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): PRESSURE INDICATION (PT ID-45)
 LICENSEE SUBMITTAL: SCEW(S): G-3 [33]

EQUIPMENT ITEM NO. 27
 PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 ROSEMOUNT MODEL 1151
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 27
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): REACTOR PRESSURE MEASUREMENT (PT 36-07A, B, C, D;
 36-08A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): G-49 THROUGH G-56 [33]

EQUIPMENT ITEM NO. 28
 TEMPERATURE SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
 FENWAL MODEL 1700240
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 28
 LICENSEE REFERENCE(S): 827, 28
 FUNCTION (PLANT ID): MAIN STEAM LINE TO RPS (TS 1B-10A THROUGH H, J THROUGH
 N, P, Q, R)
 LICENSEE SUBMITTAL: SCEW(S): H-1 THROUGH H-16 [33]

EQUIPMENT ITEM NO. 29
 D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 ROSEMOUNT MODEL 1151DP 7E22T0003PB
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 29
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MEASURES RPS STEAM FLOW (DPT 36-06A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): M-1 THROUGH M-4 [33]

EQUIPMENT ITEM NO. 30
 D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 ROSEMOUNT MODEL 1151DP
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 30
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MEASURES RPS DRYWELL PRESSURE (DPT 201.2-476A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): N-17 THROUGH N-20 [33]

EQUIPMENT ITEM NO. 31
 D/P TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
 ROSEMOUNT MODEL 1151DP 7E22T0003PB
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 31
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MEASURES RPS STEAM FLOW (DPT 01-26A THROUGH H)
 LICENSEE SUBMITTAL: SCEW(S): H-38 THROUGH H-44 [33]

EQUIPMENT ITEM NO. 32
 TEMPERATURE ELEMENT LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE
 CUBICLE, ELEV 281' 0"
 MINCO NICKEL, MODEL NOT STATED
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 32
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): EMERGENCY CONDENSER RETURN LINE BREAK DETECTION
 (TE IBO6-13, -14, -23, -24)
 LICENSEE SUBMITTAL: SCEW(S): M-5 THROUGH M-8 [33]

EQUIPMENT ITEM NO. 33
 PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 MERCOLD MODEL SD8136 SERIES L5432R21E
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 33
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): CONTAINMENT SPRAY LOW PRESSURE ALARM (PS 80-61, -60)
 LICENSEE SUBMITTAL: SCEW(S): N-9, N-10 [33]

EQUIPMENT ITEM NO. 34
 PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
 MERCOLD MODEL DA5432
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 34
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): CORE SPRAY PRESSURE ALARM (PS 40-80, -07)
 LICENSEE SUBMITTAL: SCEW(S): F-7, F-8 [33]

EQUIPMENT ITEM NO. 35
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
ROSEMOUNT MODEL 1151DP
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 35
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TRIPS TURBINE STOP VALVES (LT 36-03A, B, C, C)
LICENSEE SUBMITTAL: SCEW(S): G-4 THROUGH G-7 [33]
LICENSEE SUBMITTAL: SCEW(S): G-6 [33]
FUNCTION (PLANT ID): MEASURES LOW-LOW REACTOR LEVEL TO RPS (LT 36-04A, B, C, D; 36-05A, B, C, D)
LICENSEE SUBMITTAL: SCEW(S): G-8 THROUGH G-15 [33]

EQUIPMENT ITEM NO. 36
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
ROSEMOUNT MODEL 1151DP
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MEASURES TORUS WATER LEVEL (LT 58-05, -06)
LICENSEE SUBMITTAL: SCEW(S): F-9, F-10 [33]

EQUIPMENT ITEM NO. 37
CONTROL SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 236'0"
MERCROID MODEL CP4122
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE CONTROL (VCS 68-11A, B; 68-12A, B; 68-13A, B)
LICENSEE SUBMITTAL: SCEW(S): E-17 THROUGH E-22 [33]

EQUIPMENT ITEM NO. 38
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
GENERAL ELECTRIC MODEL 553 HB345619079
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR LEVEL MEASUREMENT (LT 1A-12)
LICENSEE SUBMITTAL: SCEW(S): G-16 [33]

EQUIPMENT ITEM NO. 39
 FLOW TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
 ROSEMOUNT MODEL 1151DP
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 39
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): CORE SPRAY PUMP FLOW MEASUREMENT (FT RV-26A)
 SERVICE:
 LICENSEE SUBMITTAL: SCEW(S): F-3 [33]

EQUIPMENT ITEM NO. 40
 FLOW TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
 ROSEMOUNT MODEL 1151DP 6B22LMMB
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 40
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MAIN STEAM LINE FLOW MEASUREMENT (FT ID-33A, B)
 LICENSEE SUBMITTAL: SCEW(S): C-1, C-2 [33]

EQUIPMENT ITEM NO. 41
 ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING
 GENERAL ELECTRIC MODEL 5K445AK249A CB161088
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 41
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): DRIVES CLOSED LOOP COOLING PUMPS (M70-01 THROUGH M70-03)
 LICENSEE SUBMITTAL: SCEW(S): J-1 THROUGH J-3 [33]

EQUIPMENT ITEM NO. 42
 ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
 GENERAL ELECTRIC MODEL 5K828837C7 HC8365172
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 42
 LICENSEE REFERENCE(S): 4021
 FUNCTION (PLANT ID): DRIVES CORE SPRAY TOPPING PUMPS (M 81-49 THROUGH M 81-52)
 LICENSEE SUBMITTAL: SCEW(S): F-2, F-12, F-14, F-19 [33]

EQUIPMENT ITEM NO. 43
 ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
 GENERAL ELECTRIC MODEL 5K6328XC136A
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 43
 LICENSEE REFERENCE(S): 3483
 FUNCTION (PLANT ID): DRIVES CONTAINMENT SPRAY PUMPS (M 80-03, M 80-04,
 M 80-23, M 80-24)
 LICENSEE SUBMITTAL: SCEW(S): N-5 THROUGH N-8 [33]

EQUIPMENT ITEM NO. 44
ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
GENERAL ELECTRIC MODEL 5K6366XC166A HC8365174
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 44
LICENSEE REFERENCE(S): 3483
FUNCTION (PLANT ID): DRIVES CORE SPRAY PUMPS (M 81-23, -24, -03, -04)
LICENSEE SUBMITTAL: SCEW(S): F-1, F-11, F-13, F-18 [33]

EQUIPMENT ITEM NO. 45
POSITION SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
NAMCO MODEL D2400X
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 45
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): AIR VENT & FILL VALVE POSITION INDICATION (POS 201-08)
LICENSEE SUBMITTAL: SCEW(S): E-2 [33]
FUNCTION (PLANT ID): EQUIPMENT DRAIN SUMP ISOLATION VALVE POSITION INDICATION
(POS 83.1-10)
LICENSEE SUBMITTAL: SCEW(S): D-6 [33]
FUNCTION (PLANT ID): DRYWELL VENTILATION & PURGE VALVE POSITION INDICATION
(POS 201-10)
LICENSEE SUBMITTAL: SCEW(S): D-3 [33]
FUNCTION (PLANT ID): FLOOR DRAIN SUMP ISOLATION VALVE POSITION INDICATION
(POS 83.1-12)
LICENSEE SUBMITTAL: SCEW(S): D-7 [33]
FUNCTION (PLANT ID): NITROGEN MAKEUP & PURGE VALVE POSITION INDICATION (POS
201-16)
LICENSEE SUBMITTAL: SCEW(S): E-7 [33]
FUNCTION (PLANT ID): NITROGEN MAKEUP & VENTILATION VALVE POSITION INDICATION
(POS 201.2-33, -06)
LICENSEE SUBMITTAL: SCEW(S): E-3, E-5 [33]

EQUIPMENT ITEM NO. 46
POSITION SWITCH LOCATED IN THE STEAM TUNNEL
NAMCO MODEL D2400X
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 46
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): MAIN STEAM BYPASS POSITION INDICATION (POS 01-05, -06)
LICENSEE SUBMITTAL: SCEW(S): B-5, B-7 [33]

EQUIPMENT ITEM NO. 47
POSITION SWITCH LOCATED IN THE EMERGENCY CONDENSER ISOLATION VALVE CUBICLE,
ELEV. 298'0"
NAMCO MODEL D2400X
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 47
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): NITROGEN MAKEUP AND BLEED ISOLATION VALVE POSITION
INDICATION (POS 201.2-32, -03)
LICENSEE SUBMITTAL: SCEW(S): D-11, D-13 [33]
FUNCTION (PLANT ID): NITROGEN VENTILATION & FILL ISOLATION VALVE POSITION
INDICATION (POS 201-32)
LICENSEE SUBMITTAL: SCEW(S): D-8 [33] --

EQUIPMENT ITEM NO. 48
POSITION SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
MICRO SWITCH MODEL 11LS1
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): 25
FUNCTION (PLANT ID): TORUS VACUUM RELIEF VALVE POSITION INDICATION (POS 68-08
THROUGH -10)
LICENSEE SUBMITTAL: SCEW(S): E-11 THROUGH E-13 [33]

EQUIPMENT ITEM NO. 49
POSITION SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
NAMCO MODEL SL3C58TW
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): MAIN STEAM VALVE POSITION INDICATION (POS 01-01, -02)
LICENSEE SUBMITTAL: SCEW(S): B-20, B-21 [33]

EQUIPMENT ITEM NO. 50
POSITION SWITCH LOCATED IN THE EMERGENCY CONDENSER RETURN VALVE CUBICLE,
ELEV. 281'0"
NAMCO MODEL SL3L
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): EMERGENCY CONDENSER ISOLATION VALVE POSITION INDICATION
(POS 39-05, 39-06)
LICENSEE SUBMITTAL: SCEW(S): B-13, B-15 [33]

EQUIPMENT ITEM NO. 51
 RADIATION DETECTOR LOCATED IN THE TURBINE BUILDING CONDENSER AREA,
 ELEV. 243'0"- 297'0"
 GENERAL ELECTRIC MODEL 194X92792
 REQUIRED OPERATING TIME: 1 HOUR
 TER CHECKSHEET NO. 51
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): MAIN STEAM LINE RADIATION DETECTION (RE RN05A, B, C, D)
 LICENSEE SUBMITTAL: SCEW(S): H-17 THROUGH H-20 [33]

EQUIPMENT ITEM NO. 52
 ELECTRICAL CONNECTOR LOCATED IN THE CONTAINMENT
 D.G. O'BRIEN MODEL 19, 5, 28 PIN #16 AND 4 PIN #8
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 52
 LICENSEE REFERENCE(S): 17, 1337
 FUNCTION (PLANT ID): ELECTRICAL PENETRATION (PLANT I.D. NOT STATED)
 SERVICE: ELECTRICAL FEEDTHROUGH
 LICENSEE SUBMITTAL: SCEW(S): A-4 [33]

EQUIPMENT ITEM NO. 53
 TERMINAL BLOCK LOCATED IN THE CONTAINMENT
 GENERAL ELECTRIC MODEL EB5 AND EB25
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 53
 LICENSEE REFERENCE(S): 30, 18
 FUNCTION (PLANT ID): ELECTRICAL CONNECTIONS (PLANT I.D. NOT STATED)
 LICENSEE SUBMITTAL: SCEW(S): A-5 [33]

EQUIPMENT ITEM NO. 54
 ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE CONTAINMENT
 RAYCHEM MODEL RG59BU
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 54
 LICENSEE REFERENCE(S): 1155
 FUNCTION (PLANT ID): INSTRUMENT CONTROL CABLE (PLANT I.D. NOT STATED)
 LICENSEE SUBMITTAL: SCEW(S): A-3 [33]

EQUIPMENT ITEM NO. 55
 ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
 J-M TYPE DUXSEAL
 REQUIRED OPERATING TIME: 28 HOURS
 TER CHECKSHEET NO. 55
 LICENSEE REFERENCE(S): NOT CITED
 FUNCTION (PLANT ID): FILLER FOR 5KV TERMINAL
 LICENSEE SUBMITTAL: SCEW(S): A-17 [33]

EQUIPMENT ITEM NO. 56
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
BURNDY MODEL GZ
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): GROUND CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-7 [33]

EQUIPMENT ITEM NO. 57
TERMINAL CONNECTION LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
BURNDY MODEL QAB
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): CABLE TO TERMINAL CONNECTION
LICENSEE SUBMITTAL: SCEW(S): A-11 [33]

EQUIPMENT ITEM NO. 58
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
BURNDY MODEL QA8CB
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): 4011
FUNCTION (PLANT ID): GROUND CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-6 [33]

EQUIPMENT ITEM NO. 59
ELECTRICAL CABLE SPLICE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
AMP TYPE PRE INSULATED
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): 20
FUNCTION (PLANT ID): BUTT CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-8 [33]

EQUIPMENT ITEM NO. 60
ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT
AMP MODEL RING TONGUE TERMINAL
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): 20
FUNCTION (PLANT ID): CABLE TERMINATION
LICENSEE SUBMITTAL: SCEW(S): A-20 [33]

EQUIPMENT ITEM NO. 61
TERMINAL LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
OZ GADNEY MODEL XL
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): 19
FUNCTION (PLANT ID): CABLE CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-9 [33]
FUNCTION (PLANT ID): CABLE CONNECTOR
LICENSEE SUBMITTAL: SCEW(S): A-1 [33]

EQUIPMENT ITEM NO. 62
CIRCUIT BREAKER LOCATED IN THE REACTOR BUILDING
GENERAL ELECTRIC MODEL AKD5
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CIRCUIT BREAKER 600V (16B, 17B)
LICENSEE SUBMITTAL: SCEW(S): L-1, L-2 [33]

EQUIPMENT ITEM NO. 63
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
3M/ELECTRO PRODUCTS MODEL NO 83
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-12 [33]

EQUIPMENT ITEM NO. 64
ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL NO 227
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): FILLER FOR 5KV TERMINAL
LICENSEE SUBMITTAL: SCEW(S): A [33]

EQUIPMENT ITEM NO. 65
ELECTRICAL CABLE LOCATED IN CONTAINMENT
GENERAL ELECTRIC MODEL VULKENE CABLE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 1135
FUNCTION (PLANT ID): POWER AND CONTROL, 600V AND 1000V
LICENSEE SUBMITTAL: SCEW(S): A [33]

EQUIPMENT ITEM NO. 66
ELECTRICAL INSULATING VARNISH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL 1309 BLACK INSULATING VARNISH
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-19 [33]

EQUIPMENT ITEM NO. 67
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
GENERAL ELECTRIC MODEL NO 8380
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE CONNECTION INSULATION TAPE
LICENSEE SUBMITTAL: SCEW(S): A-13 [33]

EQUIPMENT ITEM NO. 68
ELECTRICAL SEALANT LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE CEMENT
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-14 [33]

EQUIPMENT ITEM NO. 69
ELECTRICAL TAPE LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE 3/4 INCH FRICTION TAPE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): UNDERCOAT FOR 5KV TERMINAL FILLER
LICENSEE SUBMITTAL: SCEW(S): A-15 [33]

EQUIPMENT ITEM NO. 70
5KV TERMINAL INSULATION LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
KERITE TYPE SPLICING COMPOUND TAPE
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5KV TERMINAL INSULATION
LICENSEE SUBMITTAL: SCEW(S): A-18 [33]

EQUIPMENT ITEM NO. 71
ELECTRICAL POWER CABLE LOCATED IN THE STEAM TUNNEL
KERITE MODEL QUADRAPLEX ASSEMBLY 5KV
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POWER CABLE
LICENSEE SUBMITTAL: SCEW(S): A-1 [33]

EQUIPMENT ITEM NO. 72
MOTOR CONTROL CENTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
GENERAL ELECTRIC MODEL IC7700
REQUIRED OPERATING TIME: 28 HOURS
TER CHECKSHEET NO. 72
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): ELECTRICAL CONTROL (167, 171B, 161B, 1671)
LICENSEE SUBMITTAL: SCEW(S): L-3, L-4, L-5, L-6 [33]

EQUIPMENT ITEM NO. 73
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
LIMITORQUE MODEL SMB000, H1BC
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 73
LICENSEE REFERENCE(S): 1063
FUNCTION (PLANT ID): CONTAINMENT SPRAY TO WASTE BUILDING ISOLATION VALVE
(80-115)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-1 [15]

EQUIPMENT ITEM NO. 74
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 74
LICENSEE REFERENCE(S): 50, 2876
FUNCTION (PLANT ID): CONTAINMENT SPRAY TO WASTE BUILDING ISOLATION VALVE
(80-114)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-2 [15]

EQUIPMENT ITEM NO. 75
MOTORIZED VALVE ACTUATOR LOCATED IN THE DRYWELL, ELEV. 261'0"
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 50, 2876
FUNCTION (PLANT ID): REACTOR COOLANT SAMPLE ISOLATION VALVE (110-127)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-3 [15]

EQUIPMENT ITEM NO. 76
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): 51
FUNCTION (PLANT ID): REACTOR COOLANT SAMPLE ISOLATION VALVE (110-128)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-3 [15]

EQUIPMENT ITEM NO. 77
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
LIMITORQUE MODEL SMB0
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 77
LICENSEE REFERENCE(S): 51
FUNCTION (PLANT ID): FLOW CONTROL VALVE FOR TORUS COOLING (80-118)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-4 [15]

EQUIPMENT ITEM NO. 78
MOTORIZED VALVE ACTUATOR LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 78
LICENSEE REFERENCE(S): 49
FUNCTION (PLANT ID): EMERGENCY CONDENSER VENT TO TORUS (05-05, 05-07)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-5 [15]

EQUIPMENT ITEM NO. 79
SOLENOID VALVE LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
ASCO MODEL HT8317A29
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 79
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT SAMPLING BLOCKING VALVE (122-04 THROUGH 122-11)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-6 THROUGH TMI-13 [15]

EQUIPMENT ITEM NO. 80
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 198'0"
ROSEMOUNT MODEL 1152T0280
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): 1764, 1403, 45
FUNCTION (PLANT ID): TORUS WATER LEVEL (58-05, 58-06)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-14, TMI-15 [15]

EQUIPMENT ITEM NO. 81
PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0" (TMI ACTION
PLAN ITEM II.F.2)
ROSEMOUNT MODEL 1153GA9
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 81
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT PRESSURE (36-23A, 36-23B)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-16, TMI-17 [15]

EQUIPMENT ITEM NO. 82
PRESSURE TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
ROSEMOUNT MODEL 1153 SERIES A
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): 45, 1403, 1764
FUNCTION (PLANT ID): CONTAINMENT PRESSURE INDICATION (201.2-483, 201.2-484)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-18, TMI-19 [15]

EQUIPMENT ITEM NO. 83
LEVEL TRANSMITTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0" (TMI ACTION
PLAN ITEM II.F.2)
ROSEMOUNT MODEL 1153DA5
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT LEVEL (36-24A, B)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-20, TMI-21 [15]

EQUIPMENT ITEM NO. 84
FLOW SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0" (TMI ACTION
PLAN ITEM II.F.1)
FOXBORO MODEL E13DL TRANSMITTER
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 84
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): FLOW CONTROL (FET 664)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-22 [15]

EQUIPMENT ITEM NO. 85
PRESSURE SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
STATIC-O-RING MODEL 5NNKK351CLA
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 85
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST ACCIDENT SAMPLING PUMP BYPASS (122-14)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-23 [15]

EQUIPMENT ITEM NO. 86
RADIATION DETECTOR LOCATED IN THE REACTOR BUILDING, ELEV. 261'0"
GENERAL ATOMIC MODEL RD23
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 86
LICENSEE REFERENCE(S): 2840
FUNCTION (PLANT ID): RADIATION DETECTION (201.7-36A, 201.7-37A)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-24, TMI-25 [15]

EQUIPMENT ITEM NO. 87
LIMIT SWITCH LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
MICRO SWITCH MODEL F
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 87
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POSITION INDICATION (122-04 THROUGH 122-11)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-26 THROUGH TMI-33 [15]

EQUIPMENT ITEM NO. 88
THERMOCOUPLE LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
OMEGA MODEL HWANSA2231ZDH114T834
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (TE-70-269A, -TE-70-276A)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-34, TMI-25 [15]

EQUIPMENT ITEM NO. 89
THERMOCOUPLE LOCATED IN THE CONTAINMENT
PYCO MODEL 0231710820395
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 89
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (36-29A, B)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-36, TMI-37 [15]

EQUIPMENT ITEM NO. 90
THERMOCOUPLE LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
PYCO MODEL 0231710820395
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): TEMPERATURE MEASUREMENT (36-29C, D)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-37, TMI-38 [15]



EQUIPMENT ITEM NO. 91

ELECTRIC MOTOR LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"

FRANKLIN MOTOR/BURKS PUMPS MODEL 3CT5MJ

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 91

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PUMP MOTOR (122-01, -02)

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-39, TMI-40 [15]

EQUIPMENT ITEM NO. 92

ELECTRICAL CONNECTOR LOCATED IN THE REACTOR BUILDING, ELEV. 306'0"

D.G. O'BRIEN MODELS C10C0001G14, C10C1001G21

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 92

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CABLE CONNECTION

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-41 [15]

EQUIPMENT ITEM NO. 93

ELECTRICAL CONNECTOR LOCATED IN THE REACTOR BUILDING, ELEV. 261'0"

D.G. O'BRIEN MODELS C10C0001G14, C10C1001G21

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 93

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CABLE CONNECTION

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-42 [15]

EQUIPMENT ITEM NO. 94

ELECTRICAL CABLE, COAXIAL LOCATED IN THE REACTOR BUILDING, VARIOUS ELEVATIONS

ROCKBESTOS MODEL RSS6104

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 94

LICENSEE REFERENCE(S): 47, 48

FUNCTION (PLANT ID): RADIATION MONITOR SIGNALS

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-43 [15]

EQUIPMENT ITEM NO. 95

ELECTRICAL CABLE, INSTRUMENT LOCATED IN THE REACTOR BUILDING, VARIOUS ELEVATIONS

ROCKBESTOS MODEL TSP16

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 95

LICENSEE REFERENCE(S): 1391

FUNCTION (PLANT ID): RELATED INSTRUMENTATION MODIFICATIONS

LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-44 [15]



EQUIPMENT ITEM NO. 96
ELECTRICAL CONTROL CABLE LOCATED IN THE REACTOR BUILDING, VARIOUS ELEVATIONS
ROCKBESTOS, MODEL NOT STATED
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 96
LICENSEE REFERENCE(S): 1391
FUNCTION (PLANT ID): CONTROL CABLE
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-45, TMI-46 [15]

EQUIPMENT ITEM NO. 97
ELECTRICAL THERMOCOUPLE CABLE LOCATED IN THE REACTOR BUILDING, VARIOUS
ELEVATIONS
KERITE MODEL THERMOCOUPLE CABLE 16 AWG
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 97
LICENSEE REFERENCE(S): 52
FUNCTION (PLANT ID): TEMPERATURE SIGNALS (95-13-193)
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-47 [15]

EQUIPMENT ITEM NO. 98
MOTOR STARTER LOCATED IN THE REACTOR BUILDING, ELEV. 237'0"
GENERAL ELECTRIC MODEL CR207B223AAA
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 98
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MOTOR STARTER & DISCONNECT
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-48 [15]

EQUIPMENT ITEM NO. 99
CIRCUIT BREAKERS LOCATED IN THE REACTOR BUILDING, ELEV. 281'0"
GENERAL ELECTRIC MODEL NTE20
REQUIRED OPERATING TIME: 100 DAYS
TER CHECKSHEET NO. 99
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): BRANCH CIRCUIT BREAKERS
LICENSEE SUBMITTAL: FRC DESIGNATED SCEW(S): TMI-49 [15]

EQUIPMENT ITEM NO. 100
POSITION SWITCH LOCATED IN THE STEAM TUNNEL, ELEV. 240'0"
NAMCO MODEL SL3C58TW
REQUIRED OPERATING TIME: 1 HOUR
TER CHECKSHEET NO. 100
LICENSEE REFERENCE(S): 21
FUNCTION (PLANT ID): MAIN STEAM VALVE POSITION INDICATION (POS 01-03, -04)
LICENSEE SUBMITTAL: SCEW(S): B-3, B-4 [33]

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 on the Licensee's submittal, the staff concluded that the information on safety-related systems included in the submittal was insufficient to verify that those systems were all the systems 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 environment. The staff acknowledged the Licensee's effort to include only those safety-related systems located in a potentially harsh environment; however, the review required the listing of all safety-related systems, both inside and outside potentially harsh environments. The list of safety-related systems submitted by the Licensee follows:

- o Containment Isolation (Drywell) (CID)
- o Containment Isolation (Torus) (CIT)
- o Automatic Depressurization System (ADS)
- o Core Spray (CS)
- o Reactor Isolation (RI)
- o Reactor Vessel Instrumentation (RVI)
- o Additional Instrumentation (AI)
- o Reactor Building Closed Loop Cooling (RBCLC)
- o Feedwater Flow - High Pressure (HPCI) (FF-HPCI)
- o Feedwater Flow - Low Pressure (HPCI) (FFL-HPCI)
- o Feedwater Flow - HPCI (FF)
- o Control Rod Drive (CRD)
- o Common Electrical Equipment (CEE)
- o MG Sets 162-172 (MG)
- o Power Distribution (PD)
- o Reactor Building Emergency Ventilation (RBEV)
- o Emergency Condensers (EC)
- o H₂11 H₂, O₂ Monitoring System #11 (H₂11)
- o H₂12 H₂, O₂ Monitoring System #12 (H₂12)
- o Containment Atmosphere Dilution (CAD)
- o Containment Spray.

In the Licensee's response [14] to the NRC's concern, the Licensee stated:

"Based on the NMPC submittal (November 3, 1980 assessment), the staff concluded that the information on safety related systems was insufficient to verify that systems considered were all the systems required to achieve or support the following functions:

- 1) emergency reactor shutdown
- 2) containment isolation
- 3) reactor core cooling
- 4) containment heat removal
- 5) core residual heat removal
- 6) prevention of significant release radioactive material to the environment

The list of NMP-1 systems presented in the November 3, 1980 submittal included all systems, both inside and outside potentially harsh areas, necessary to provide the six functions listed above. The following systems list includes the safety functions provided by each system.

- o Common Electrical Equipment (CEE): includes electrical components common to all systems, e.g., cable, connectors, etc., and therefore supports all six functions
- o Reactor Isolation (RI): provides function 6
- o Automatic Depressurization System (ADS): provides functions 3 and 5

- o Containment Isolation - Drywell (CID): provides functions 2 and 6
- o Containment Isolation - Torus (CIT): provides functions 2 and 6
- o Core Spray (CS): provides functions 3 and 5
- o Reactor Vessel Instrumentation (RVI): initiates functions 1, 2, 3, 4, and 6
- o Additional Instrumentation (AI): initiates functions 1, 4, and 6
- o Reactor Building Closed Loop Cooling (RBCLC): supports functions 3 and 4
- o Control Rod Drive (CRD): provides function 1
- o MG Sets 162 and 172: support all 6 functions
- o Power Distribution (PD): supports all 6 functions
- o Containment Spray (CoS): provides functions 4 and 5

It should be noted that the systems list originally provided in the November 3, 1980 submittal has been revised.

The following six systems have been deleted for the reasons provided.

o HPCI System

Reason - The HPCI system is not powered from emergency power supplies and is not taken credit for in safety analyses. Its safety-related function is duplicated by core spray in conjunction with ADS.

o Emergency Condenser System

Reason - The main purpose of the emergency condenser system is to assure long term cooling during isolation events by maintaining coolant inventory. Credit is not taken for this system in LOCA/HELB safety analyses.

o CAD and H₂O₂ Monitoring Systems

Reason - The purpose of the inerting systems is to provide an inert nitrogen atmosphere in the drywell and torus in case the core spray system does not function properly following a LOCA; i.e., these systems only serve as a backup to the core spray system. Possible use of the H₂O₂ monitoring system for radiation sampling of drywell air falls under the scope of R.G. 1.97, and the NRC has indicated that those items will be evaluated separately from the IEB 79-01B response.

- o Reactor Building Emergency Ventilation System

Reason - According to the NMP-1 FSAR, the reactor building emergency ventilation system is not a required engineered safeguard. A postulated 100% core meltdown without reactor building emergency ventilation will approach 10 CFR 100 limits only if the reactor building integrity is such that it leaks 1800% of its volume per day at -0.25 inches of water differential pressure. The reactor building is designed for maximum leakage of 100% of building volume per day at a -0.25 inches of water differential pressure.

- o MG Sets 162-172

Reason - The MG system has been removed from the 79-01B scope because it has been determined that its components are not subjected to harsh environments. Our definition of mild environment is discussed in Section 3.2.

Thus, with the exception of the MG sets, the systems list provided beforehand represents the 79-01B systems list for NMP-1."

Evaluation

In the SER dated June 8, 1981 [13], the NRC staff concluded that the information included in the Licensee's submittal of November 3, 1980 [1] was insufficient to verify that six specified safety functions would be achieved. In responding to the SER, the Licensee has deleted the following from the list of safety-related systems:

- o HPCI System
- o Emergency Condenser System
- o CAD and H₂O₂ Monitoring Systems
- o Reactor Building Emergency Ventilation System
- o MG Sets 162-172.

The other systems identified in the November 3, 1980 submittal remain on the list and the Licensee has identified which of the six safety functions are performed by each system.

The Licensee's list of systems remains insufficient to verify that all safety functions will be performed. For example, the Licensee's list indicates that reactor core cooling and containment heat removal (functions 3 and 4) are performed by the reactor building closed loop cooling water (RBCLC) system.

However, the service water and emergency service water systems, which service the RBCLC system, are not on the list. Furthermore, the Licensee's list indicates that residual heat removal (function 5) is performed by the core spray, automatic depressurization, and containment spray systems. This is the only listed method for residual heat removal (since neither the emergency condenser nor any other decay heat removal systems are on the list). In the case of a MSLB or FWLB outside containment, the proposed method is less desirable than other methods of decay heat removal because it creates a hostile environment inside containment where otherwise one does not exist. In general, the availability of back-up methods of performing a post-accident safety function does not obviate the need for environmental qualification of the primary method unless the backup method is essentially an identical replacement. Consequently, removal of the HPCI, emergency condenser, CAD, H_2O_2 monitoring, and reactor building emergency ventilation systems is not justified.

In addition, the Licensee apparently misconstrued the NRC's position on Regulatory Guide 1.97. Regulatory Guide 1.97 is effective for operating plants as of June 1983 and a review for compliance is a separate item from IE Bulletin 79-01B. Nevertheless, display instruments needed for accident mitigation, for post-accident monitoring, or to aid the operator in the post-accident safe handling of the plant require environmental qualification in accordance with IE Bulletin 79-01B. These requirements are independent of Regulatory Guide 1.97 and no instrument requiring qualification under IE Bulletin 79-01B is to be deferred from review at this time because Regulatory Guide 1.97 may require additional qualification later.

It is recommended that a thorough review of plant safety analyses and emergency procedures be performed with regard to the safety functions necessary for LOCA and HELB accident mitigation. A complete and comprehensive list of systems to be addressed for environmental qualification should be submitted to the NRC for review and approval.

C.2 SAFETY-RELATED INSTRUMENTATION

In Section 3.1 of the NRC SER dated June 8, 1981 [13], 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 not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. 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 14, the Licensee provided the following response:

"The staff requested that NMPC provide a complete list of display instrumentation mentioned in LOCA and HELB emergency procedures. Component evaluation worksheets were requested for all components of display instrumentation exposed to harsh environments with the exception of non-safety related equipment and post-accident sampling, monitoring, and radiation monitoring equipment. Justification for considering an instrument as non-safety related and assurance that its subsequent failure will not mislead the operator or adversely affect accident mitigation are required. Post-accident sampling and monitoring equipment will be reviewed in conjunction with TMI Lessons-Learned modifications.

Table 3-3 provides a listing of display instruments mentioned in the NMP-1 special operating procedures for LOCA and HELB. The table includes a column listing the associated instrument components currently within the 79-01B workscope, i.e., in harsh environments. Component evaluation worksheets are provided for these items in Appendix A.

For the remaining display instruments, NMPC will defer environmental qualification until these procedures have been revised using emergency procedure guidelines which are currently being reviewed by the staff. This deferment is considered justified in that the components being qualified now are considered sufficient to ensure safe handling of the plant by the operator.

TABLE 3-3 DISPLAY INSTRUMENTATION

<u>Items Listed in LOCA and/or HELB Procedures</u>	<u>Instrumentation Component in Harsh Environment - Evaluation Sheet Included in Appendix A</u>
Vessel level	36-03A-D, 36-04A-D, 36-05A-D, 1A-12
Vessel pressure	ID46A, ID46B, ID45
High drywell pressure alarm	202.2-476 A-D
High drywell temperature	--
High drywell radiation alarm	
Drywell leak detector	
Drywell high rate of rise	
Drywell sump pump excessive operation	
Steam flow/feed flow mismatch	
All rods in	
Neutron flux decreasing	
Containment isolation	Containment isol. systems list position switch
Vessel isolation	Reactor isol. system list position switch
Stop, intercept valves closed	Containment and reactor isol. systems position switch
DC oil pumps running	
Emergency seal oil pump running	
Breaker R-111 open	
CRD pump running	
Loss of 115KV	
Breakers R-1012 and R-1013 open	

TABLE 3-3 (Cont.)

<u>Items Listed in LOC and/or HELB Procedures</u>	<u>Instrumentation Component in Harsh Environment - Evaluation Sheet Included in Appendix A</u>
Auto. depressurization	NR-108 A-F position switches
Core spray running	40-80, 40-07 pressure switches
Condensate pump running	--
Core spray flow	
Feedwater flow	
Torus water temperature	
Containment O ₂ and H ₂	
Condensate surge and storage tank levels	
Torus water level	
Automatic actions	RVI and AI system trip units and transmitter
Drywell pressure	201.2-476 A-D
Demin. water tank level	
Emergency condenser makeup tank level	
Diesel generator start	
Reactor bldg. emergency ventilation operating	
345KV power trip	
Disconnect 18 open	
Emergency condenser in service"	

Evaluation

The list of instruments submitted in Table 3-3 has been reviewed. The second column of Table 3-3 is interpreted to mean that instruments for which evaluation sheets have not been provided are not located in a harsh environment. Based on this interpretation, it is considered that the Licensee has responded to the NRC's concern.

C.3 SAFETY RELATED ELECTRICAL COMPONENTS

In Reference 14, the Licensee stated:

"A component-by-component review has been performed by NMPC to more closely define component safety-related functions and revise the master parts list presented in the previous (November 3, 1980 assessment) report.

Revision of the master parts list of safety-related electrical components essential to LOCA/HELB mitigation is based on the following considerations:

- o Analysis of components safety-related functions and deletion of those components whose operations are not essential to LOCA/HELB mitigation
- o Review of accident environments and deletion of those components which are located in the mild environments.

A current listing of safety-related electrical components considered by NMPC to be necessary to mitigate the consequences of a LOCA/HELB is provided in Table 3-1. Display instruments located in the harsh environments are noted in Table 3-3 and included in Table 3-1.

A listing of the components previously considered in the scope of IEB 79-01B but now deleted based on the above reasons is provided in Table 3-2, and a component-by-component justification is provided in Appendix B."

Evaluation

As noted in Section C.1, deleting display instruments from environmental qualification because they are covered by Regulatory Guide 1.97 is not justified. Instruments which require qualification under IE Bulletin 79-01B must be qualified without regard to any additional requirements

of Regulatory Guide 1.97. Consequently, instruments listed in Table 3-2 of Reference 14 should not be deleted or deferred from environmental qualification.

In addition, the following concerns are identified regarding the information submitted by the Licensee in Appendix B to Reference 14:

<u>Component No.</u>	<u>Concern</u>
01-03, 01-04	The Licensee does not indicate whether these SOVs will be deenergized prior to the harsh environment. A qualified backup MOV is helpful but also subject to single-active failure. The main steam line isolation feature must be qualified for its post-accident environment.
58-04	Although not referenced by LOCA/HELB procedures, the torus level alarm is an indication which must be available to the operator during a LOCA or HELB condition.
RN-38A ₁ , RN-38A ₂ , P-101	Regulatory Guide 1.97 should not be used to defer qualification of display instruments which perform a safety-related function or are part of LOCA/HELB emergency procedures.
RV-26B, RV-26A	Reactor vessel level instruments are not a complete substitute for CS flow instrumentation. In a decreasing level situation, CS flow instrumentation can alert the operator to the cause of the decreasing level. CS flow instruments should be qualified.
80-49A, 80-71A, 80-56A, 80-76A	Pump discharge pressure indication is not a complete substitute for CoS flow indication. Closed or partially closed valves downstream of the pump can result in near-normal pressure when there is reduced flow.

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 [13]:

"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:

- o 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.

- o 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

* 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: Niagara Mohawk Power Corporation
Plant Name: Nine Mile Point Unit 1
NRC Docket No. 50-220
NRC TAC No. 42476
NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 466

References:

- a. Niagara Mohawk Power Corporation Response to Nuclear Regulatory Commission Safety Evaluation Report of June 8, 1981 for Nine Mile Point Unit 1, September 8, 1981
- b. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Nine Mile Point Unit 1
Environmental Qualification of Safety-Related
Electrical Equipment
NRC, June 8, 1981

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, in general, 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:

<u>Equipment Item</u>	<u>Equipment Description/ Function</u>	<u>SCEW Sheet No.</u>	<u>Status Code</u>	<u>Basis for Deficiency</u>
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. However, specific schedules for testing or replacement were not provided in the response to the SER."

4. SUBSEQUENT REVIEW

In Reference 33, the Licensee provided additional justifications for continued operation in instances where continuing analyses had resulted in changes to previously submitted data. Many of these justifications were related to continued operation with display instruments which are to be replaced.

Evaluation

The information provided by the Licensee in Reference 33 provides a technically sound basis for justification of interim operation with the reported equipment.

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

Niagara Mohawk Power Corporation
Nine Mile Point Unit 1

NRC Docket No. 50-220

-- December 30, 1981

NRC TAC No. 42476

Rev. 1, April 6, 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 November 1, 1980 [1], February 2, 1981 [2], March 5, 1980 [3], and September 8, 1981 [4].* FRC previously requested TMI Action Plan information by a telephone memorandum dated August 31, 1981 [5]. By letters dated February 2, 1982 [8] and March 2, 1982 [9], the Licensee transmitted TMI Action Plan equipment information and qualification documentation.^{(1)**}

On April 2, 1982 [10] the Licensee submitted revised SCEW sheets and justification for continued operation.⁽²⁾

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 [4] to the NRC SER [6], a legible single copy of each of the following qualification documents is requested in order that the FRC evaluation may proceed:

a. NUS Report 1961-0005-001⁽¹⁾

3/12/82 [9]⁽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.

***This column will be completed by FRC as the requested information is received.

DATE RECEIVED BY FRC***

b. NUS Report 1961-G080-001 including GE Letter #G-EN-8-18 dated February 24, 1978	<u>3/12/82 [9]</u> (1)
c. Burndy Test Report TD-78-595A	<u>79-601A</u> <u>3/12/82 [9]</u> (1)
d. NUS Report 1961-A382(1)	<u>3/12/82 [9]</u> (1)
e. NUS Report 1961-G049-001(1)	<u>3/12/82 [9]</u> (1)
f. NUS Report 1961-A382-001(1)	<u>3/12/82 [9]</u> (1)
g. NUS Report 1961-N007-001(1)	<u>3/12/82 [9]</u> (1)
h. NUS Report R369-001	
i. Laurence Bulletin for Series 500 and 500 HP Two-Way Rotary Shaft Type Solenoid Valves, Issue 5 and Drawing #2600E	<u>3/12/82 [9]</u> (1)
j. NUS Report 1961-A499-001	<u>3/12/82 [9]</u> (1)
k. Micro Switch Test Report LTR-24407, 2/24/77	<u>3/12/82 [9]</u> (1)
l. NUS Report 1961-M302-001(1)	<u>3/12/82 [9]</u> (1)
m. GE Letter G-EN-O-164 dated 10/16/80	<u>3/12/82 [9]</u> (1)
n. NUS Report 1961-R369-002-R1(1)	<u>3/12/82 [9]</u> (1)
o. NUS Report 1961-F080-001-R1(1)	<u>3/12/82 [9]</u> (1)
p. NUS Report 1961-F135-001(1)	<u>3/12/82 [9]</u> (1)
q. BWR Equipment Qualification Summary 44-E-01	<u>3/12/82 [9]</u> (1)
r. BWR Equipment Qualification Summary QSR-96-A-3, October 16, 1981(1)	<u>3/12/82 [9]</u> (1)
s. GE Report PED 126-62, January 15, 1975	<u>3/12/82 [9]</u> (1)
t. BWR Equipment Qualification Summary 111-A-01, October 14, 1980	<u>3/12/82 [9]</u> (1)
u. Bechtel Power Corp. File No. 10855-E117 (9)-42-1	<u>3/12/82 [9]</u> (1)

B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

INFORMATION REQUESTED

DATE RECEIVED BY FRC***

1. References 2 and 4 do not provide adequate detail with respect to identification of TMI Action Plan equipment installed after 1/1/81.

3/3/82 [8](1)
3/12/82 [9](1)

 - a. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested.

3/12/82 [9](1)
 - b. The correlation of these equipment items with the specific sections of NUREG-0737 [6] presented below (as applicable) is requested.

3/12/82 [9](1)

IIE4.2, IID3, IIB3, IIE4.1, IIK3.13,
 IIK3.15, IIK3.19, IIK3.21, IIK3.27.

[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?]
 - c. 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.

3/12/82 [9](1)
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.]

3/12/82 [9](1)

 - a. GE Letter #G-EN-8-18, dated 2/24/81
 - b. BWR Equipment Qualification Summary

3/12/82 [9](1)

010-A-01 dated 3/28/78

DATE RECEIVED BY FRC***

c. NES Document 81A0636(81A-636), Rev. 0,
dated 7/15/80

3/12/82 [9](1)

d. NES Letter 5152-008, dated July 18, 1980

3/12/82 [9](1)

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. Electrical Equipment Environmental Qualification Assessment For Nine Mile Point Unit 1
Niagara Mohawk Power Corporation, 01-Nov-80
2. T. E. Lempges (NMPCO)
Letter to B. H. Grier, NRC.
Subject: Response to IE Bulletin 79-01B, Supplement 3.
Niagara Mohawk Power Corporation, 02-Feb-81
3. T. E. Lempges (NMPCO)
Letter to B. H. Grier, NRC.
Subject: Response to IE Bulletin 79-01B, Supplement 2.
Niagara Mohawk Power Corporation, 02-Feb-81
4. Niagara Mohawk Power Corporation Response to Nuclear Regulatory Commission Safety Evaluation Report of June 8, 1981 for Nine Mile Point Unit 1, September 8, 1981
5. Telephone Memorandum. Subject: Discussion Between Niagara Mohawk Power Corporation, NRC and FRC on Request for Additional Information Concerning TMI Action Plan Equipment, 31-Aug-81
6. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Nine Mile Point Unit 1
Environmental Qualification of Safety-Related
Electrical Equipment
NRC, June 8, 1981
7. NUREG-0737, "Clarification of TMI Action Plan Requirements"
NRC, November 1980
8. T. E. Lempges
Letter to R. C. Haynes, NRC
Subject: Transmittal of System Component Evaluation Work Sheets for
TMI Action Plan Equipment
Niagara Mohawk Power Corp. 02-Feb-82(1)
9. T. E. Lempges
Letter to D. B. Vassallo, NRC
Subject: Nine Mile Point Unit 1; Additional Information Requested
Concerning Environmental Qualification of Safety-Related Equipment
Niagara Mohawk Power Corp. 02-Mar-82(1)

10. T. E. Lempges
Letter to D. B. Vassalo, NRC
Subject: Transmittal of Revised Work Sheets and Additional
Justification for Continued Operation, Nine Mile Point Unit 1
Niagara Mohawk Power Corp., 02-Apr-82⁽²⁾

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